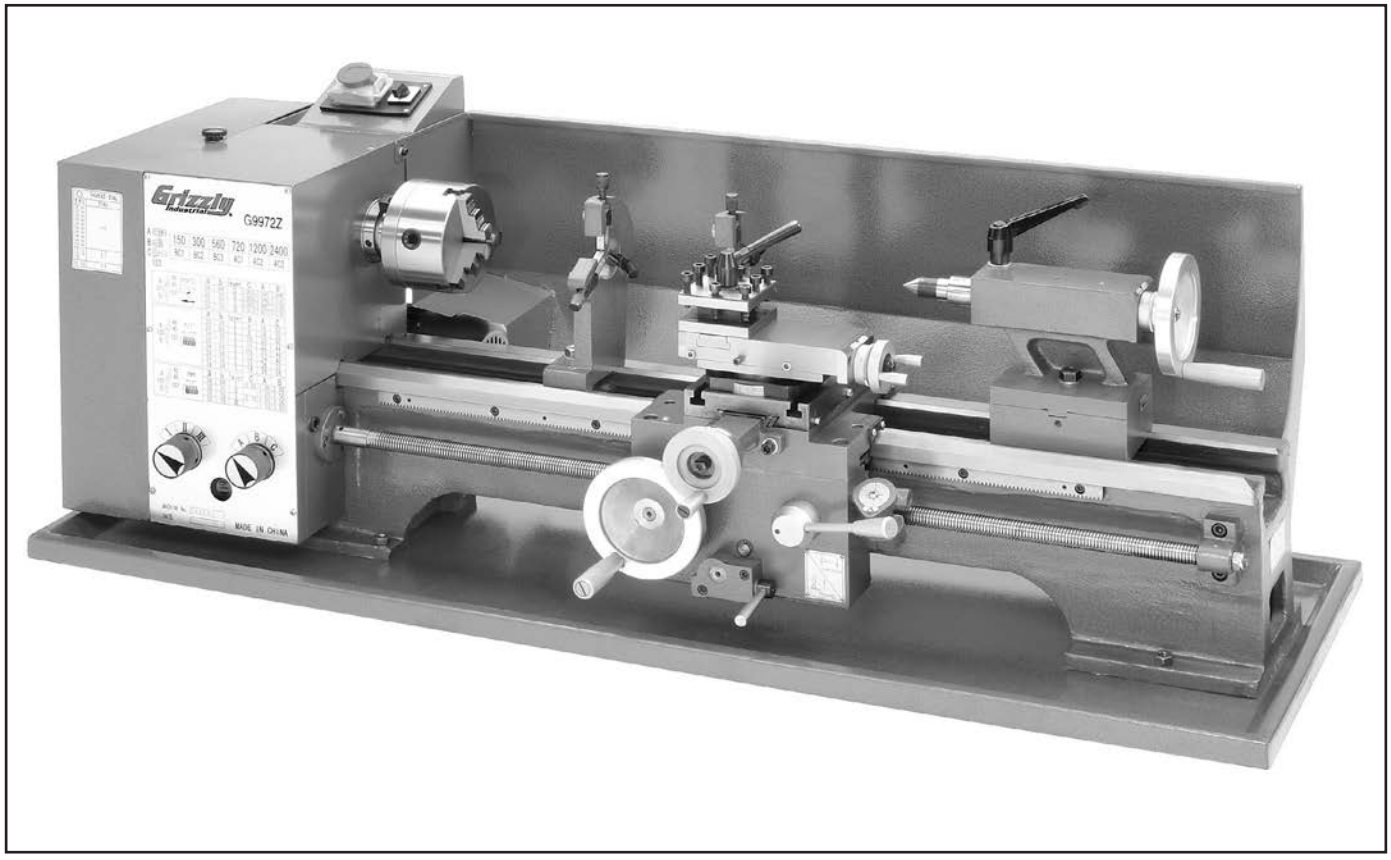
MODEL G9972Z
11" x 26" LIGHT-DUTY LATHE w/GEARBOX
OWNER'S MANUAL



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#TS10714 PRINTED IN CHINA

⚠ WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance, and service of this machine/tool. Save this document, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine/tool is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, cutting/sanding/grinding tool integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.

⚠ WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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INTRODUCTION

Foreword

We are proud to offer the Model G9972Z 11" x 26" Light-Duty Lathe w/Gearbox. This machine is part of a growing Grizzly family of fine metalworking machinery. When used according to the guidelines set forth in this manual, you can expect years of trouble-free, enjoyable operation and proof of Grizzly's commitment to customer satisfaction.

The specifications, drawings, and photographs illustrated in this manual represent the Model G9972Z when the manual was prepared. However, owing to Grizzly's policy of continuous improvement, changes may be made at any time with no obligation on the part of Grizzly. For your convenience, we always keep current Grizzly manuals available on our website at **www.grizzly.com**. Any updates to your machine will be reflected in these manuals as soon as they are complete. Visit our site often to check for the latest updates to this manual!

Contact Info

We stand behind our machines. If you have any service questions, parts requests or general questions about the machine, please call or write us at the location listed below.

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
Fax: (800) 438-5901
E-Mail: techsupport@grizzly.com

If you have any comments regarding this manual, please write to us at the address below:

Grizzly Industrial, Inc.
C/O Technical Documentation Manager
P.O. Box 2069
Bellingham, WA 98227-2069
Email: manuals@grizzly.com

Functional Overview

The primary purpose of the metal lathe is to make concentric cuts in metal stock. With the lathe, round stock can be made perfectly concentric, threaded, drilled, knurled, bored, tapered, etc. Square stock can be made into precision round shafts used for axles, spindles, leadscrews, punches, etc.

The maximum size of workpiece a lathe can cut is determined by the swing, which is the distance from the center line of the spindle to the bed, and the throw, which is the maximum distance between the tailstock and the spindle. However, this lathe features an open spindle that allows longer workpieces to extend through the headstock.

During typical operations, the lathe cuts with a fixed cutting tool that is positioned against a rotating workpiece. To rotate a workpiece, the operator centers it on a clamping device called a chuck or faceplate, then securely clamps the chuck or faceplate to the spindle so it will not fly loose during operation.

The spindle connects to the motor through a series of pulleys that control the speed the spindle can rotate, which allows the operator different options for cutting based on the type of metal and size of workpiece.

The cutting tool is mounted on a tool post, which is positioned by three different bases that move linearly in their own designated direction. The bottom base is the carriage, which moves left and right, and is equipped with a power feed system for automated cutting and threading operations. The middle base is the cross slide, which moves in and out. The top base is the compound slide, which moves diagonally.

The lathe is also outfitted with a support device called a tailstock. The tailstock is mounted on the lathe bed opposite of the spindle, and it moves toward or away from the spindle and can be locked against the bed to firmly support the end of a long workpiece.

Identification

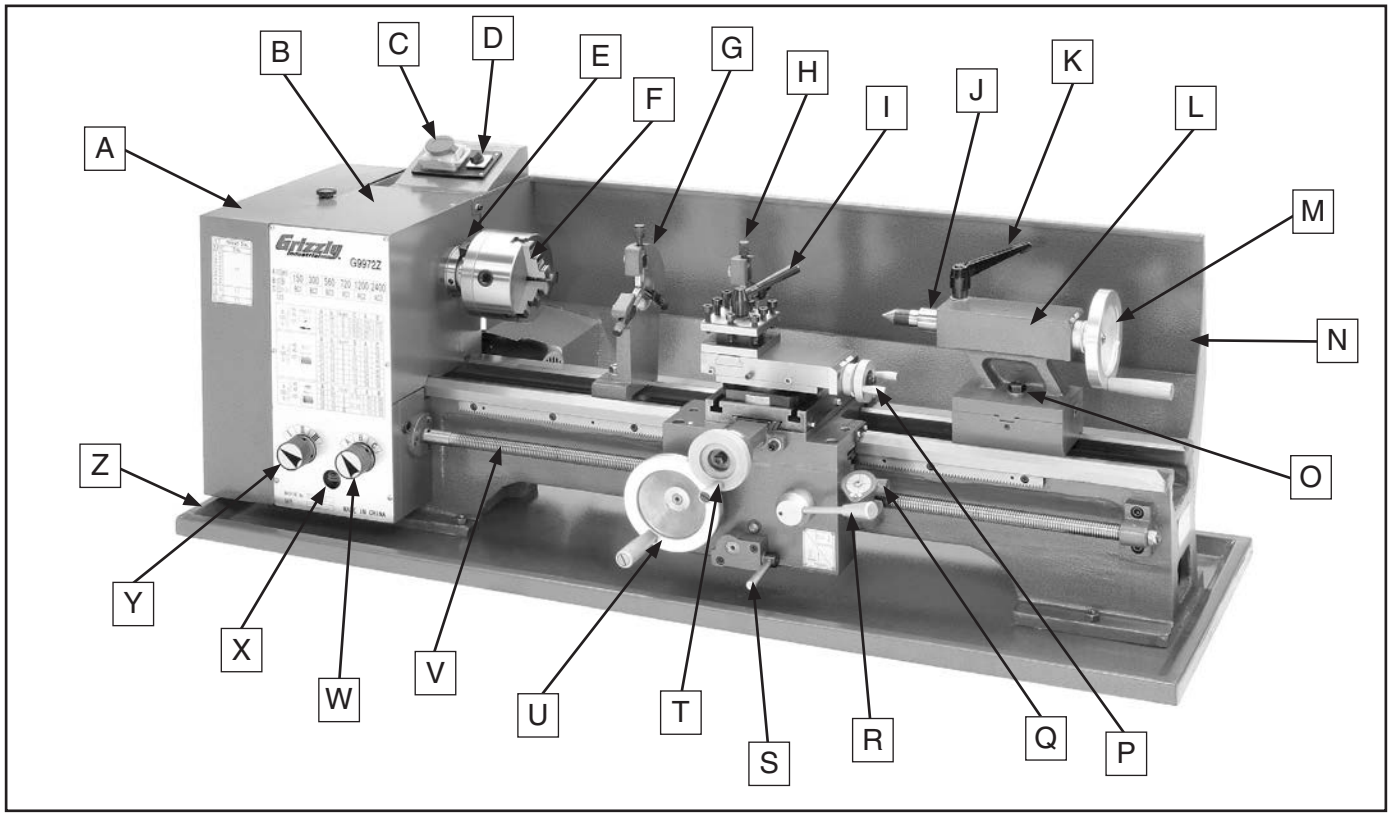


Figure 1. Model G9972Z identification.

A. Change Gear Cover
B. Headstock
C. Motor ON/OFF Switch
D. Spindle Switch
E. Threaded Spindle 1¾"-8 MT#4
F. 3-Jaw Chuck 5"
G. Steady Rest
H. Follow Rest
I. 4-Way Tool Post
J. Tailstock Quill
K. Quill Lock
L. Tailstock
M. Quill Handwheel
N. Splash Guard
O. Tailstock Lock Bolt
P. Compound Slide & Handwheel
Q. Thread Dial
R. Half-Nut Lever
S. Power Feed Lever
T. Cross Slide Handwheel
U. Carriage Handwheel
V. Leadscrew ¾"-8 x 34½"
W. Right Feed Rate Dial
X. Feed Rate Gearbox Oil Sight Glass
Y. Left Feed Rate Dial
Z. Chip Pan

MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G9972Z 11" X 26" BENCH LATHE W/ GEARBOX

Product Dimensions:

Weight	490 lbs.
Width (side-to-side) x Depth (front-to-back) x Height	51 x 23 x 19 in.
Footprint (Length x Width)	51 x 18 in.

Shipping Dimensions:

Type	Wood Crate
Content	Machine
Weight	560 lbs.
Length x Width x Height	58 x 30 x 26 in.
Must Ship Upright	Yes

Electrical:

Power Requirement	110V, Single-Phase, 60 Hz
Prewired Voltage	110V
Full-Load Current Rating	13.6A
Minimum Circuit Size	20A
Connection Type	Cord & Plug
Power Cord Included	Yes
Power Cord Length	4 ft.
Power Cord Gauge	12 AWG
Plug Included	Yes
Included Plug Type	5-15
Switch Type	ON/OFF Push Button Switch w/Safety Cover

Motors:

Main

Type	TEFC Capacitor-Start Induction
Horsepower	1 HP
Phase	Single-Phase
Amps	13.6A
Speed	1725 RPM
Power Transfer	Belt Drive
Bearings	Shielded & Permanently Lubricated

Main Specifications:

Operation Info

Swing Over Bed	10.63 in.
Distance Between Centers	26 in.
Swing Over Cross Slide	6-3/8 in.
Swing Over Saddle	6-3/8 in.
Maximum Tool Bit Size	1/2 in.
Compound Travel	3-1/2 in.
Carriage Travel	23 in.
Cross Slide Travel	7 in.

Other

Optional Stand	G9973

Headstock Info

Spindle Bore	1 in.
Spindle Size	1-3/4 in.
Spindle Taper	MT#4
Spindle Threads	8 TPI
Number of Spindle Speeds	6
Spindle Speeds	150 – 2400 RPM
Spindle Type	Threaded
Spindle Bearings	Tapered Roller

Tailstock Info

Tailstock Quill Travel	2-1/2 in.
Tailstock Taper	MT#3
Tailstock Barrel Diameter	1.125 in.

Threading Info

Number of Longitudinal Feeds	12
Range of Longitudinal Feeds	0.0022 – 0.0150 in./rev.
Number of Inch Threads	24
Range of Inch Threads	8 – 56 TPI
Number of Metric Threads	10
Range of Metric Threads	0.5 – 3.0 mm

Dimensions

Bed Width	6 in.
Carriage Leadscrew Diameter	3/4 in.
Leadscrew TPI	8 TPI
Carriage Leadscrew Length	34-1/2 in.
Steady Rest Capacity	1/4 – 2 in.
Follow Rest Capacity	1/4 – 2 in.
Faceplate Size	8 in.

Construction

Base	Formed Steel
Headstock	Cast Iron
End Gears	Steel
Bed	Hardened and Precision-Ground Cast Iron
Body	Cast Iron
Paint Type/Finish	Epoxy

Other Specifications:

Country Of Origin	China
Warranty	1 Year
Approximate Assembly & Setup Time	1 Hour
Serial Number Location	ID Label
ISO 9001 Factory	No
CSA Certified	No

Features:

Easy to Read Control Panel
Emergency Stop
Long Bed Accommodates 26" Between Centers
Threading Dial

SECTION 1: SAFETY

⚠WARNING

For Your Own Safety, Read Instruction Manual Before Operating this Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures.

⚠DANGER **Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.**

⚠WARNING **Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.**

⚠CAUTION **Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.**

NOTICE **This symbol is used to alert the user to useful information about proper operation of the machine.**

⚠WARNING

Safety Instructions for Machinery

OWNER'S MANUAL. Read and understand this owner's manual BEFORE using machine. Untrained users can be seriously hurt.

EYE PROTECTION. Always wear ANSI-approved safety glasses or a face shield when operating or observing machinery. to reduce the risk of eye injury or blindness from flying particles Everyday eyeglasses are not approved safety glasses.

HAZARDOUS DUST. Dust created while using machinery may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material, and always wear a NIOSH-approved respirator to reduce your risk.

WEARING PROPER APPAREL. Do not wear clothing, apparel, or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to avoid accidental slips which could cause a loss of workpiece control.

HEARING PROTECTION. Always wear hearing protection when operating or observiing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

MENTAL ALERTNESS. Be mentally alert when running machinery. Never operate under the influence of drugs or alcohol, when tired, or when distracted.

⚠WARNING
Safety Instructions for Machinery

DISCONNECTING POWER SUPPLY. Always disconnect machine from power supply before servicing, adjusting, or changing cutting tools (bits, blades, cutters, etc.). Make sure switch is in OFF position before reconnecting to avoid an unexpected or unintentional start.

INTENDED USE. Only use the machine for its intended purpose and only use recommended accessories. Never stand on machine, modify it for an alternative use, or outfit it with non-approved accessories.

STABLE MACHINE. Unexpected movement during operations greatly increases the risk of injury and loss of control. Verify machines are stable/secure and mobile bases (if used) are locked before starting.

FORCING MACHINERY. Do not force machine. It will do the job safer and better at the rate for which it was designed.

GUARDS & COVERS. Guards and covers can protect you from accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly before using machine.

REMOVING TOOLS. Never leave adjustment tools, chuck keys, wrenches, etc. in or on machine—especially near moving parts. Verify removal before starting!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make workpiece control difficult or increase the risk of accidental injury.

DANGEROUS ENVIRONMENTS. Do not use machinery in wet locations, cluttered areas, around flammables, or in poorly-lit areas. Keep work area clean, dry, and well lighted to minimize risk of injury.

APPROVED OPERATION. Untrained operators can be seriously hurt by machinery. Only allow trained or properly supervised people to use machine. When machine is not being used, disconnect power, remove switch keys, or lock-out machine to prevent unauthorized use—especially around children. Make workshop kid proof!

CHILDREN & BYSTANDERS. Keep children and bystanders a safe distance away from work area. Stop using machine if children or bystanders become a distraction.

FEED DIRECTION. Unless otherwise noted, feed work against the rotation of blades or cutters. Feeding in the same direction of rotation may pull your hand into the cut.

SECURING WORKPIECE. When required, use clamps or vises to secure workpiece. A secured workpiece protects hands and frees both of them to operate the machine.

UNATTENDED OPERATION. Never leave machine running while unattended. Turn machine ***OFF*** and ensure all moving parts completely stop before walking away.

MAINTENANCE & INSPECTION. A machine that is not properly maintained may operate unpredictably. Follow all maintenance instructions and lubrication schedules to keep machine in good working condition. Regularly inspect machine for loose bolts, alignment of critical parts, binding, or any other conditions that may affect safe operation. Always repair or replace damaged or misadjusted parts before operating machine.

EXPERIENCING DIFFICULTIES. If at any time you are experiencing difficulties performing the intended operation, stop using the machine! Contact our Technical Support Department at (570) 546-9663.

⚠WARNING
Additional Safety Instructions for Lathes

1. **UNDERSTANDING THE MACHINE:** Read and understand this manual before operating the machine.

2. **CLEANING MACHINE:** To avoid lacerations, do not clear chips by hand. Use a brush, and never clear chips while the lathe is operating.

3. **USING CORRECT TOOLING:** Always select the right cutter for the job, and make sure cutters are sharp. The right tool decreases strain on the lathe components and reduces the risk of unsafe cutting.

4. **ELIMINATING A PROJECTILE HAZARD:** Always remove the chuck key after use, and never walk away from the lathe with the chuck key installed.

5. **SECURING A WORKPIECE:** Make sure the workpiece is properly held in the chuck before starting the lathe. A workpiece thrown from the chuck could cause severe injury.

6. **AVOIDING OVERLOADS:** Always use the appropriate spindle speed and feed rate.

7. **AVOIDING ENTANGLEMENT INJURIES:** Never attempt to slow or stop the lathe chuck; and tie back long hair, ponytails, loose clothing, and sleeves so they do not dangle.

8. **PREVENTING A CUTTING TOOL/CHUCK CRASH:** Always disengage the power feed and half-nut after completing a job.

9. **AVOIDING STARTUP INJURIES:** Make sure the workpiece, cutting tool, and tool post have adequate clearance before starting the lathe. Check the chuck saddle clearance before starting the lathe. Make sure the spindle RPM is set correctly for the workpiece diameter before starting the lathe. Large parts can be ejected from the chuck if the chuck speed is set too high.

10. **CHUCK SAFETY:** Chucks are surprisingly heavy and awkward to hold, so protect your hands and the bedways. Always use a chuck cradle or piece of plywood over the bedways.

11. **WORKPIECE SUPPORT:** Support a long workpiece if it extends outboard from the headstock so it will not wobble violently when the lathe is turned ***ON***. If the workpiece extends more than 2.5 times its diameter from the chuck, support it by a center or steady rest, or it may deflect and fall out of the chuck while cutting.

12. **MAINTAINING A SAFE WORKPLACE:** Never leave lathe unattended while it is running.

⚠WARNING

Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to decrease the risk of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

⚠CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or poor work results.

SECTION 2: CIRCUIT REQUIREMENTS

110V Operation

⚠WARNING

Serious personal injury could occur if you connect the machine to power before completing the setup process. DO NOT connect the machine to the power until instructed later in this manual.

⚠WARNING

Electrocution or fire could result if machine is not grounded and installed in compliance with electrical codes. Compliance MUST be verified by a qualified electrician!

Full Load Amperage Draw

This machine draws the following amps under maximum load:

Amp Draw..... 13.6 Amps

Power Supply Circuit Requirements

You MUST connect your machine to a grounded circuit that is rated for the amperage given below. Never replace a circuit breaker on an existing circuit with one of higher amperage without consulting a qualified electrician to ensure compliance with wiring codes. **If you are unsure about the wiring codes in your area or you plan to connect your machine to a shared circuit, consult a qualified electrician.**

Minimum Circuit Size.....20 Amps

Power Connection Device

The Model G9972Z comes with a 5-15 plug, similar to **Figure 2**, to connect the machine to power.

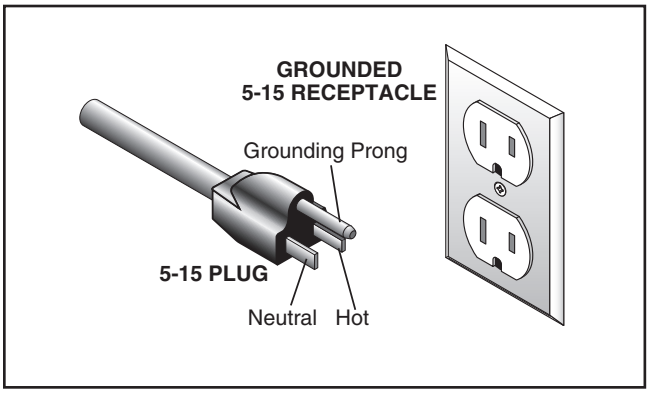
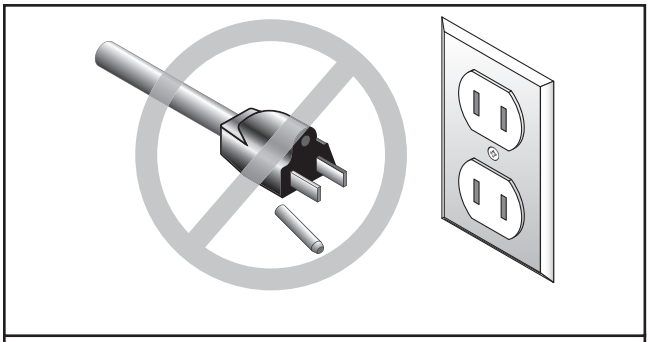


Figure 2. Typical 5-15 plug and receptacle.



⚠CAUTION

This machine MUST have a ground prong in the plug to help ensure that it is grounded. DO NOT remove ground prong from plug to fit into a two-pronged outlet! If the plug will not fit the outlet, have the proper outlet installed by a qualified electrician.

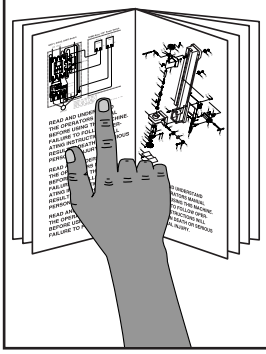
Extension Cords

We do not recommend using extension cords, but if you find it absolutely necessary:

- Use at least a 14 gauge cord that does not exceed 50 feet in length!
- The extension cord must have a ground wire and plug pin.
- A qualified electrician MUST size cords over 50 feet long to prevent motor damage.

SECTION 3: SETUP

Setup Safety

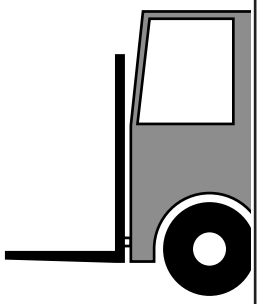


⚠WARNING

This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!

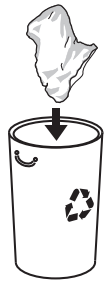
⚠WARNING

Wear safety glasses during the entire setup process!



⚠WARNING

The Model G9972Z is a heavy machine. Serious personal injury may occur if safe moving methods are not used. To be safe, get assistance and use power equipment rated for at least 750 lbs. to move the shipping crate and remove the machine from the crate.



⚠WARNING

SUFFOCATION HAZARD!

Immediately discard all plastic bags and packing materials to eliminate choking/suffocation hazards for children and animals.

Items Needed for Setup

The following items are needed to complete the setup process, but are not included with your machine:

Description	Qty
• Assistant	1
• Safety Glasses	1 For Each Person
• Machinist's Level	1
• Lifting Straps (rated for at least 750 lbs)	2
• Power Lifting Equipment (rated for at least 750 lbs)	As Needed
• Machine Mounting Hardware	As Needed
• NGLI #2 Grease	As Needed
• ISO 68 or Equivalent Lubricant	As Needed

Unpacking

Your machine was carefully packaged for safe transportation. Remove the packaging materials from around your machine and inspect it. If you discover the machine is damaged, *please immediately call Customer Service at (570) 546-9663 for advice.*

Save the containers and all packing materials for possible inspection by the carrier or its agent. *Otherwise, filing a freight claim can be difficult.*

When you are completely satisfied with the condition of your shipment, inventory the contents.

If any nonproprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

Inventory

The following is a description of the main components shipped with your machine. Lay the components out to inventory them.

Note: *If you can't find an item on this list, check the mounting location on the machine or examine the packaging materials carefully. Occasionally we pre-install certain components for shipping purposes.*

Inventory: (Figure 3)		Qty
A.	Lathe 11" x 26" (not shown)	1
B.	Faceplate 8"	1
C.	Toolbox	1
D.	Steady Rest	1
E.	Follow Rest	1
F.	4-Way Tool Post	1
G.	3-Jaw Chuck 5"	1
H.	4-Jaw Chuck 6½"	1
I.	3-Jaw Chuck Key	1
J.	Dead Center MT#4	1
K.	External Jaws for 3-Jaw Chuck	3
L.	Dead Center MT#3	1
M.	Change Gears 28, 35, 63, 69, 70, 77, 78T	1 Each
N.	Screwdrivers Standard/Phillips	1 Each
O.	Hex Wrenches 3, 4, 5, 6, 8mm	1 Each
P.	Wrenches 8/10, 12/14, 17/19mm	1 Each
Q.	4-Jaw Chuck Key	1
R.	V-belt 3L290 (not shown)	1
S.	Splash Pan (not shown)	1

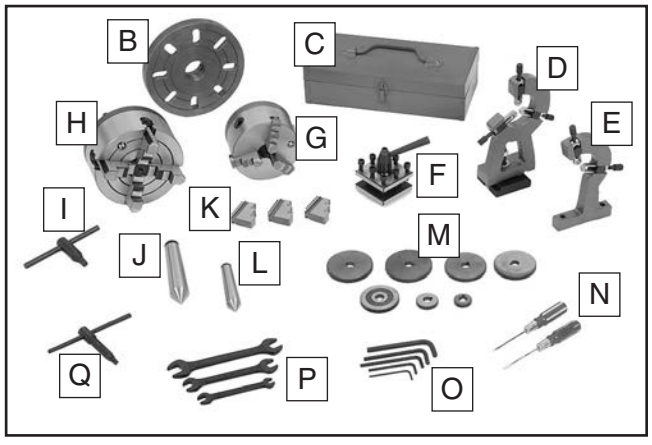


Figure 3. Model G9972Z inventory.

Clean Up

The unpainted surfaces are coated with a waxy oil to prevent corrosion during shipment. Remove this protective coating with a solvent cleaner or degreaser, such as shown in **Figure 4**. For thorough cleaning, some parts must be removed. **For optimum performance, clean all moving parts or sliding contact surfaces.** Avoid chlorine-based solvents, such as acetone or brake parts cleaner that may damage painted surfaces. Always follow the manufacturer's instructions when using any type of cleaning product.

⚠WARNING

Gasoline and petroleum products have low flash points and can explode or cause fire if used to clean machinery. DO NOT use these products to clean the machinery.

⚠CAUTION

Many cleaning solvents are toxic if inhaled. Minimize your risk by only using these products in a well ventilated area.

G2544—Solvent Cleaner & Degreaser
A great product for removing the waxy shipping grease from your machine during clean up.

Figure 4. Cleaner/degreaser available from Grizzly.

Site Considerations

Floor Load

Refer to the **Machine Data Sheet** on **Page 4** for the weight and footprint specifications of your machine. Some residential floors may require additional reinforcement to support both the machine and operator. Make sure the workbench or stand you plan to use can safely handle the weight and vibration of the lathe and operational materials.

Placement Location

Consider existing and anticipated needs, size of material to be processed through each machine, and space for auxiliary stands, work tables or other machinery when establishing a location for your new machine. See **Figure 5** for the minimum working clearances.

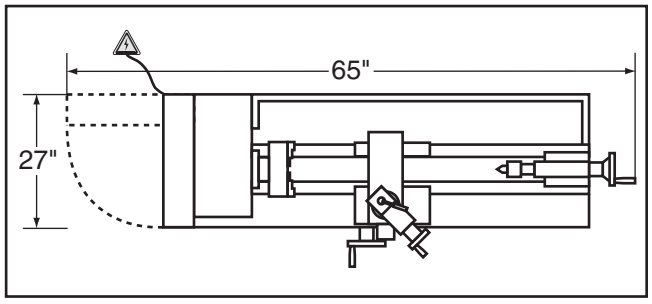
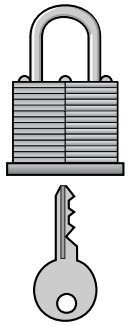


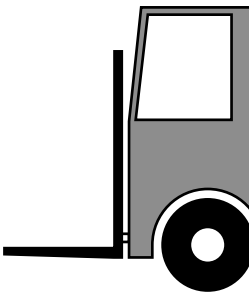
Figure 5. Minimum working clearances.



⚠CAUTION

Children and visitors may be seriously injured if unsupervised around this machine. Lock entrances to the shop or disable start switch or power connection to prevent unsupervised use.

Moving & Placement



⚠WARNING

The Model G9972Z is a heavy machine. Serious personal injury may occur if safe moving methods are not used. To be safe, get assistance and use power equipment rated for at least 750 lbs. to move the shipping crate and remove the machine from the crate.

To move and place your lathe:

1. Remove the top and side crating materials, and the chip pan, 4-jaw chuck, faceplate, and toolbox from the shipping pallet.

2. Position the chip pan on the selected mounting surface and use it as a template to prepare holes for the mounting hardware (refer to **Mounting** on **Page 13**).

3. Use the 17mm wrench to remove the hex nuts that secure the lathe to the shipping pallet.

⚠WARNING

Only use lifting straps and power lifting equipment rated for at least 750 lbs. and in good working condition. If the lathe falls or tips over while moving it, serious personal injury and property damage could result.

4. Wrap the lifting straps around the bed and between the leadscrew and the bedway, as shown in **Figure 6**.

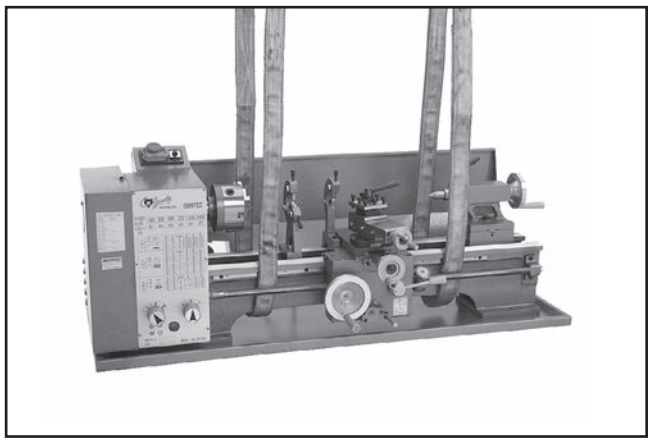


Figure 6. Lifting strap positions.

NOTICE

Make sure the lifting straps are between the leadscrew and bedway to avoid bending the leadscrew when lifting the lathe.

5. Position the lifting straps at either end of the bedway, then secure them to the lifting equipment.

6. With the help of an assistant to balance and steady the load, lift the lathe and place it on the chip pan with the mounting holes aligned.

   Note: *If necessary, move the carriage or tailstock to help balance the load.*

7. To ensure accurate results from your lathe, use a machinist's precision level to make the lathe bedway exactly level from side-to-side and front-to-back. If necessary, use shims between the lathe and chip pan.

   Note: *Re-check the bedway after 24 hours, after two weeks, then annually to make sure it remains level.*

Mounting

The strongest mounting option is a "Through Mount" where holes are drilled all the way through the workbench, and hex bolts, washers, and hex nuts are used to secure the lathe to the workbench, as illustrated in **Figure 7**.

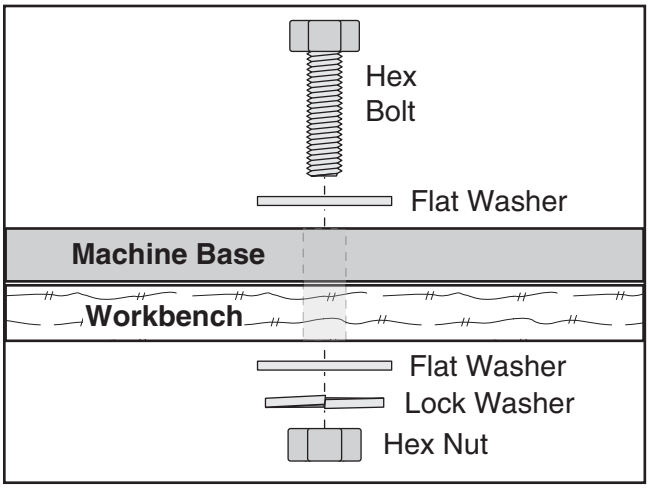


Figure 7. Example of a through mount setup.

Another option for mounting is a "Direct Mount" where the machine is simply secured to the workbench with a lag screw, as illustrated in **Figure 8**.

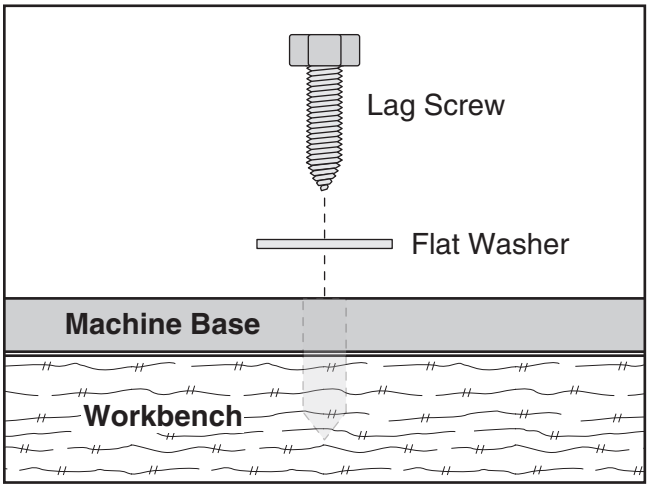


Figure 8. Example of a direct mount setup.

Note: *We recommend using a silicon sealant between the flat washers and the chip pan to avoid coolant or other fluids leaking through onto the bench or floor.*

Check Gearbox Oil

It is critical that you make sure there is oil in the feed rate gearbox before proceeding with the test run. Refer to the **Lubrication** instructions on **Page 41** for more details on which type of oil to use, how much to use, and where to put it.

Test Run

Once the assembly is complete, test run your machine to make sure it runs properly.

If, during the test run, you cannot easily locate the source of an unusual noise or vibration, stop using the machine immediately, then review the **Troubleshooting** on **Page 45**.

If you still cannot remedy a problem, contact our Tech Support at (570) 546-9663 for assistance.

To test run the machine:

1. Make sure you have read the safety instructions at the beginning of the manual and that the machine is set up properly.

2. Read and understand the **Basic Controls** subsection on **Page 16**.

3. Make sure all tools and objects used during setup are cleared away from the machine.

4. Perform all lubrication procedures as instructed in the **Lubrication** subsection on **Page 41**.

5. Move the half-nut lever up to disengage the half-nut, and push the power feed lever down to disengage the carriage power feed, as shown in **Figure 9**.

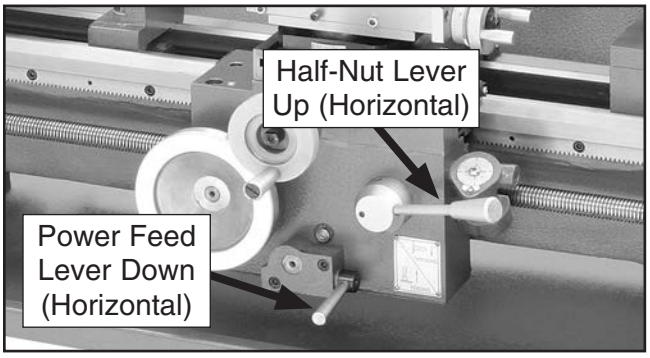


Figure 9. Half-nut and power feed lever positions for Test Run.

NOTICE

ALWAYS make sure the power feed lever and the half-nut lever are disengaged before starting the lathe to avoid carriage crashes with the headstock or tailstock.

6. Connect the machine to the power source.

7. Lift the cover of the motor ON/OFF switch and turn the motor ***ON***.

8. Flip the spindle switch to the right "**R**" position—the spindle should rotate *counterclockwise* and the leadscrew should turn *clockwise*.

   Note: *Listen to and watch for abnormal noises or actions. The machine should run smoothly with little or no vibration or rubbing noises.*

   Strange or unusual noises should be investigated and corrected before operating the machine further. Always disconnect the machine from power when investigating or correcting potential problems.

9. Flip the spindle switch to the center "**O**" position and wait for the spindle to come to a complete stop.

10. Turn the spindle switch to the left "**L**" position—the spindle should rotate *clockwise* and the leadscrew should turn *counterclockwise*.

11. Press the red button on the motor ON/OFF switch.

—If the motor stops, the emergency stop feature of the switch is working as designed.

—If the motor does NOT stop, immediately disconnect the machine from power. The emergency stop feature is not working correctly. This safety feature must work properly before proceeding with regular operations. Call Tech Support for help.

12. After successfully completing all the **Test Run** steps, proceed to **Spindle Break-In**.

Spindle Break-In

NOTICE

Successfully complete all of the spindle break-in steps to avoid rapid deterioration of the spindle bearings and other related parts.

1. DISCONNECT LATHE FROM POWER!

2. Make sure the lathe is properly lubricated (refer to **Lubrication** on **Page 41** for detailed instructions).

3. Configure the spindle belt for the lowest spindle speed (refer to **Spindle Speed** on **Page 29** for detailed instructions).

4. Connect the machine to power, turn the spindle switch to the "**R**" position to start spindle rotation in the counterclockwise direction, then let the lathe run for 10 minutes.

5. Stop the spindle rotation and wait until the spindle has come to a complete stop.

6. Start spindle rotation in the opposite clockwise direction and let the lathe run for 10 minutes.

7. Disconnect the machine from power, then repeat **Steps 4–6** for each of the spindle speeds.

8. Turn the lathe ***OFF***. The spindle break-in is complete and your lathe is ready for operation.

Carriage Lock

The carriage is supplied with a lock bolt on the front right-hand side of the saddle (see **Figure 10**). This bolt locks the carriage in place for increased rigidity when making face cuts. This lock bolt must be loosened before attempting to move the carriage manually or with the power feed.

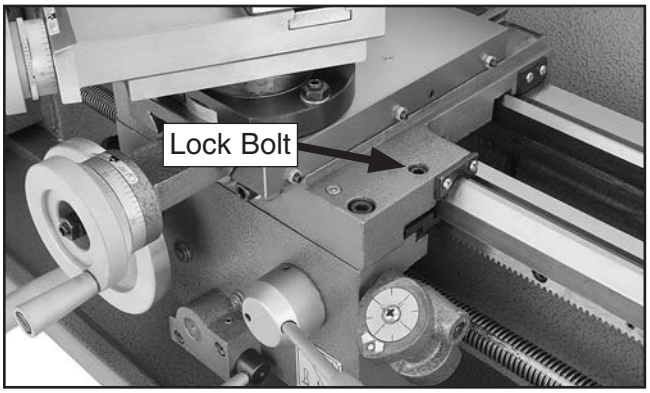


Figure 10. Carriage lock bolt.

Recommended Adjustments

For your convenience, the adjustments listed below have been performed at the factory.

However, because of the many variables involved with shipping, we recommend that you at least verify the following adjustments to ensure the best possible results from your new machine.

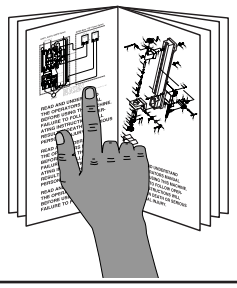
Step-by-step instructions for these adjustments can be found in the **SERVICE** section starting on **Page 45**.

Factory adjustments that should be verified:

- Cross slide backlash adjustment (**Page 48**)
- Gib adjustments (**Page 49**)

SECTION 4: OPERATIONS

Operation Safety

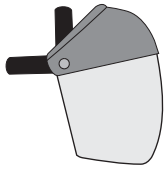


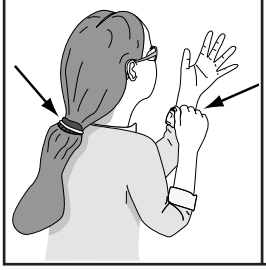
⚠WARNING

To reduce the risk of serious injury when using this machine, read and understand this entire manual before beginning any operations.

⚠WARNING

Damage to your eyes and face could result from using this machine without proper protective gear. Always wear safety glasses or a face shield when operating this machine.





⚠WARNING

Loose hair, clothing, or jewelry could get caught in machinery and cause serious personal injury. Keep these items away from moving parts at all times to reduce this risk.

NOTICE

If you have never used this type of machine or equipment before, WE STRONGLY RECOMMEND that you read books, trade magazines, or get formal training before beginning any projects. Regardless of the content in this section, Grizzly Industrial will not be held liable for accidents caused by lack of training.

Basic Controls

Refer to **Figures 11–13** and the descriptions below to become familiar with the basic controls and components of your lathe.

Headstock

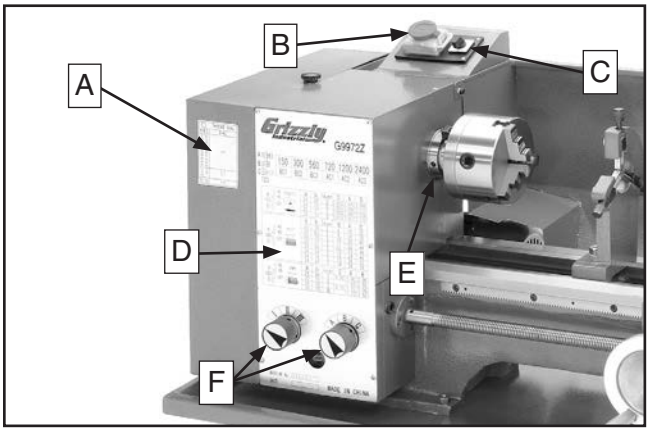


Figure 11. Headstock controls and charts.

A. Thread Dial Chart: Shows the numbers on the thread dial to engage the half-nut for threading operations.

B. Power Switch: Allows power to flow to the motor—lift the switch for the ON button, and press the top red button to cut power to the motor.

C. Spindle Switch: Starts/stops spindle rotation—turn the switch to the left for clockwise rotation, to the right for counterclockwise rotation, and to the center to stop spindle rotation.

D. Configuration Chart: Provides configuration information for spindle speeds, power feed rates, and threading operations.

E. Spindle: Holds a chuck, faceplate, or center for workpiece mounting.

F. Feed Rate Dials: Configure the feed rate gearing for carriage power feed and threading operations.

Carriage

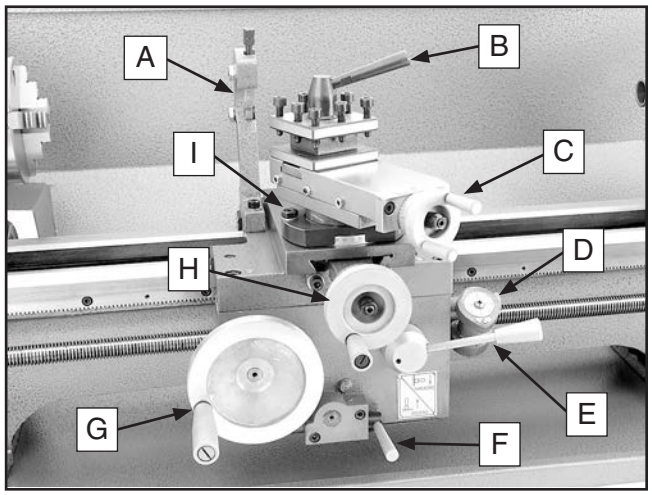


Figure 12. Carriage controls and components.

A. Follow Rest: Follows the movement of the carriage and provides support for long, slender stock to prevent workpiece flexing from the pressure of the cutting tool.

B. 4-Way Tool Post Lock Lever: Secures the cutting tools in the tool post.

C. Compound Slide Handwheel: Moves the compound slide and tooling toward or away from the workpiece.

D. Thread Dial: Shows when to engage the half-nut during inch threading operations.

E. Half-Nut Lever: Opens and closes the half-nut on the longitudinal leadscrew, which engages the carriage power feed for threading.

F. Power Feed Lever: Configures the apron gears for powered carriage movement. Move the lever up to engage the power feed and down to disengage.

G. Carriage Handwheel: Moves the carriage along the bedway.

H. Cross Slide Handwheel: Move the cross slide and tooling in a path perpendicular to the workpiece.

I. Compound Slide Lock Nuts: Secures the rotational position of the compound slide.

NOTICE

NEVER attempt to engage the carriage power feed (lever up) and the half-nut (lever down) at the same time, and NEVER force these levers. Always disengage the half-nut (lever up) before moving the power feed lever up. Otherwise, severe damage to the lathe could occur.

Tailstock

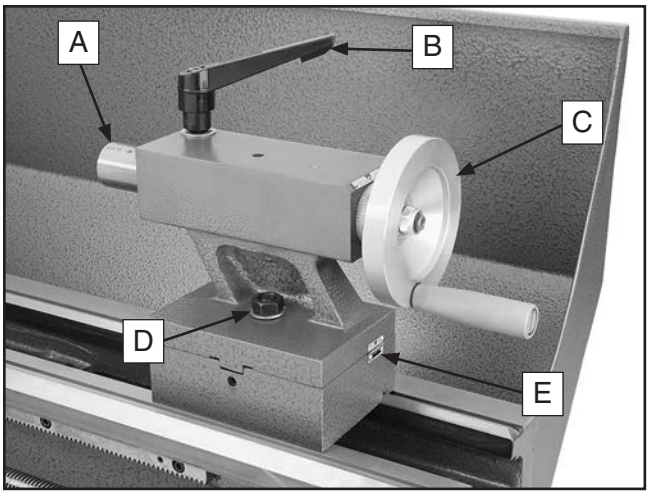


Figure 13. Tailstock controls and components.

A. Quill: Holds a tapered center or tool and moves toward or away from the spindle with the use of the handwheel.

B. Quill Lock: Locks the quill and the installed tool in place.

C. Quill Handwheel: Moves the quill in and out of the tailstock casting.

D. Tailstock Lock Nut: Secures the tailstock in place on the bedway.

Chuck & Faceplate Mounting/Removal

The Model G9972Z lathe is shipped with a 5" 3-jaw chuck installed on the spindle, but also includes a 6½" 4-jaw chuck and a 8" faceplate. The chucks and faceplate mount to the threaded spindle in the same manner.

Before installing or storing the chucks or faceplate, clean away debris and grime, then apply a protective coat of a product like Primrose Armor Plate to avoid rust and corrosion (see **ACCESSORIES** on **Page 37**).

Tools Needed	**Qty**
Hex Wrench 5mm	1
Chuck Key	As Needed
Chuck Cradle or Piece of Plywood	1

Mounting a Chuck or Faceplate

1. DISCONNECT LATHE FROM POWER!

2. Lay a chuck cradle (see **Figure 14**) or a piece of plywood over the bedways below the spindle to reduce the risk of injury and to protect the precision ground surfaces of the bedways.

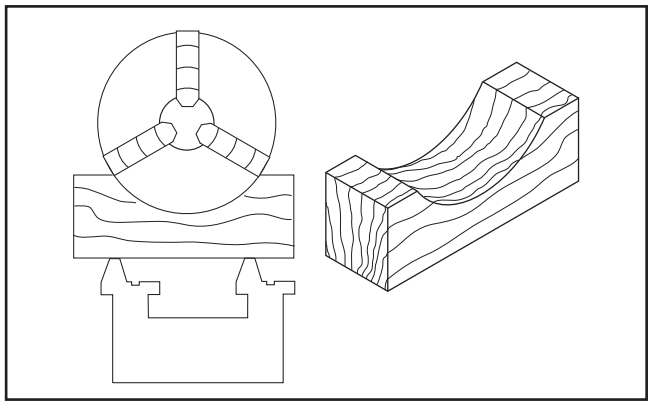


Figure 14. Simple chuck cradle made from scrap lumber.

3. Clean away any debris and grime from the threads of the spindle and chuck or faceplate, then apply a thin coat of light machine oil to the inside threads of the chuck or faceplate.

4. Thread chuck or faceplate onto the spindle and fully tighten by hand. If necessary, insert a chuck key handle into the spindle indent to keep the spindle from rotating.

Note: *Overtightening the chuck or faceplate will make removal difficult and could damage the threads.*

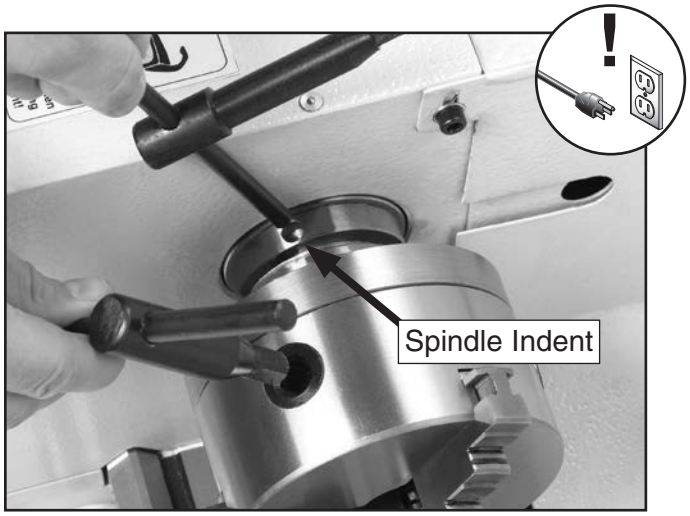
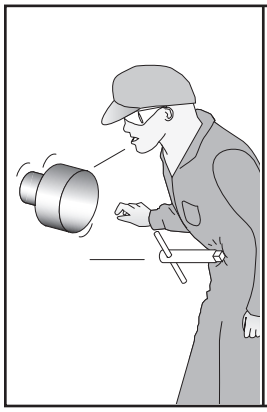


Figure 15. Example of using chuck keys to tighten the chuck onto the spindle.



⚠WARNING

Make sure the chuck or faceplate is firmly secure on the spindle and remove the chuck key. Objects thrown from the lathe could cause serious personal injury or death to the operator or bystanders.

5. Position spindle clamps as shown in **Figure 16**, then tighten the cap screws to secure chuck or faceplate to spindle.

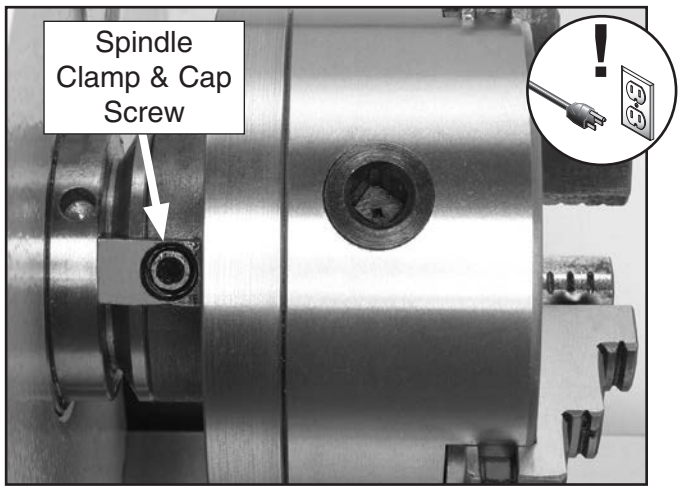
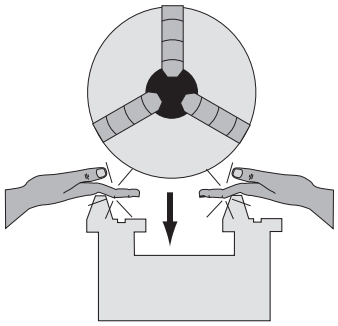


Figure 16. Spindle clamp and cap screw securing chuck/faceplate to spindle.

6. Remove the chuck cradle or plywood and any tools used before starting the lathe.

⚠WARNING



PINCH HAZARD! Protect your hands and the precision ground bedways with plywood or a chuck cradle when removing the lathe chuck! The heavy weight of a falling chuck can cause serious injury.

Removing a Chuck or Faceplate

1. DISCONNECT LATHE FROM POWER!

2. Lay a chuck cradle (see **Figure 14**) or a piece of plywood over the bedways below the spindle to reduce the risk of injury and to protect the precision ground surfaces of the bedways.

3. Remove both spindle clamps from behind the chuck or faceplate (see **Figure 16**).

4. Insert the chuck keys into the spindle indent, as shown in **Figure 15**, then unthread the chuck or faceplate from the spindle.

3-Jaw Chuck

The 3-jaw chuck included with this lathe is a scrolling-type chuck, which means all three jaws move at the same time when the chuck key is turned.

There is also an external set of jaws included that accommodate additional workpiece configurations. Use the correct jaws to hold your workpiece firmly and securely on the chuck (see **Figure 17** for examples).

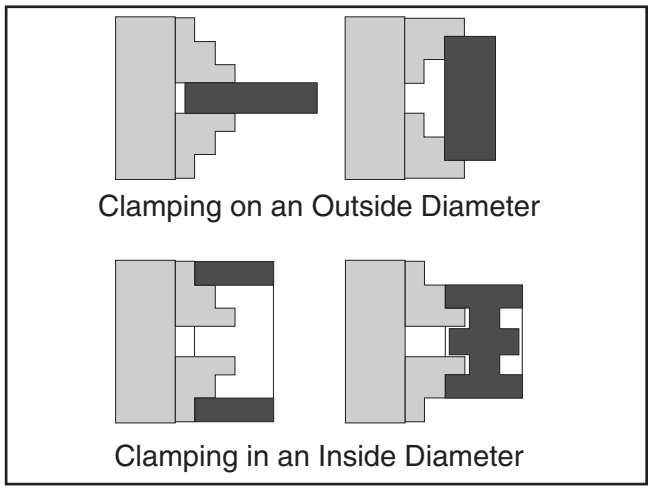


Figure 17. Examples of using the 3-jaw chuck to hold a workpiece.

Tools Needed	**Qty**
3-Jaw Chuck Key	1

Mounting Workpiece in 3-Jaw Chuck

1. DISCONNECT LATHE FROM POWER!

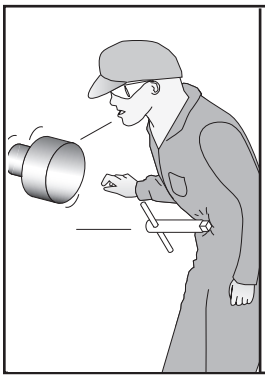
2. Use the chuck key to open the jaws until the workpiece sits flat against the chuck face, evenly on the jaw steps, or fits into the chuck hole and through the spindle.

3. Close the jaws until they make light contact with the workpiece.

4. Rotate the chuck by hand to make sure all three jaws evenly contact the workpiece and the workpiece is centered.

—If the workpiece is off center, loosen the jaws and adjust the workpiece.

—If the workpiece is centered, fully tighten the jaws.



⚠WARNING

Securely clamp your workpiece and remove the chuck key! Thrown objects from a lathe can cause serious injury or death to the operator and to bystanders many feet away.

Removing Jaws from 3-Jaw Chuck

1. DISCONNECT LATHE FROM POWER!

2. Place a piece of wood below the chuck to protect the bedways.

3. Insert and turn the chuck key counterclockwise to back the jaws all the way out.

4. Clean the jaw mating surfaces, then apply a thin coat of an anti-rust protective lubricant.

Note: *Store the jaws in a place free from moisture and abrasives.*

Installing Jaws into 3-Jaw Chuck

1. DISCONNECT MACHINE FROM POWER!

2. Thoroughly clean debris and grime from the jaws and chuck jaw guides, then apply a thin film of lubricant to the mating surfaces.

3. Examine the jaws—each is stamped with a number 1–3.

4. Insert and rotate the chuck key clockwise until you see the beginning of the scroll gear lead thread come into view through the jaw guide, then back it off slightly until it disappears (see **Figure 18**).

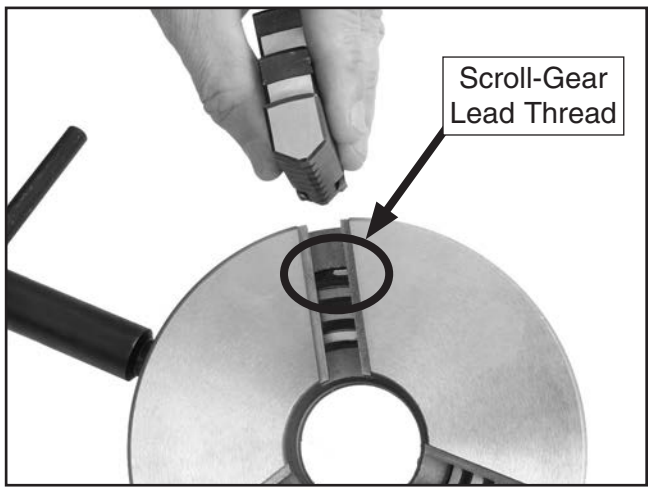


Figure 18. Installing the first jaw in the 3-jaw chuck.

5. Slide the #1 jaw into the jaw guide and hold it firmly against the scroll gear threads, then rotate the chuck clockwise a couple of turns to send the lead thread through the jaw.

6. Repeat **Steps 4–5** for jaw #2 and #3 in sequence.

—If installed correctly, the three jaws will converge evenly at the center of the chuck.

—If the jaws do not come together evenly, remove them, make sure the numbers of the jaws and jaw guide match, then reinstall the jaws.

4-Jaw Chuck

The 4-jaw chuck included with this lathe features independently adjustable hardened steel jaws. Each jaw can be removed from the chuck body and reversed for a wide range of work holding configurations. Install the 4-jaw chuck on the spindle according to the instructions on **Page 18**.

⚠WARNING

Large chucks are very heavy. Always get assistance when removing or installing large chucks to prevent personal injury or damage to the chuck or lathe.

Tools Needed	**Qty**
4-Jaw Chuck Key	1

To mount a workpiece in the 4-jaw chuck:

1. DISCONNECT LATHE FROM POWER!

2. Place a piece of wood below the chuck to protect the bedways.

3. Use the chuck key to open each jaw until the workpiece can lie flat against the chuck face or evenly on the jaw steps.

Continued on next page ⟶

4. With assistance to hold the workpiece in place, tighten each jaw in small increments. After adjusting the first jaw, continue tightening in opposing sequence, as shown in **Figure 19**, until the workpiece is firmly secure in the desired position.

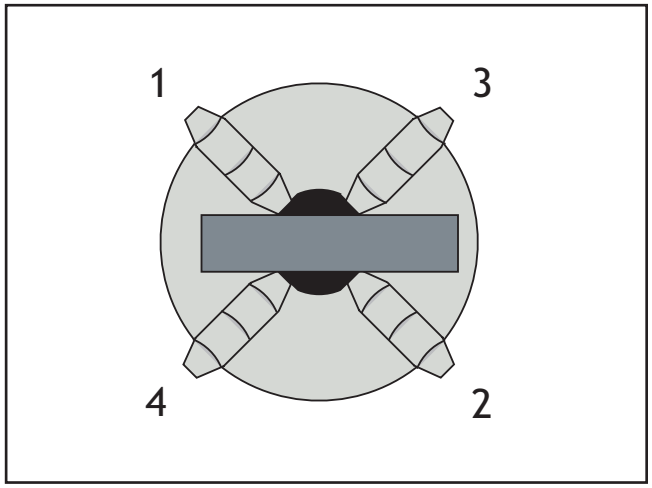


Figure 19. Tightening sequence for the 4-jaw chuck.

5. Make fine adjustments to the workpiece position by using a test indicator and adjusting the jaws until the workpiece is precisely aligned (see **Figure 20** for an example).

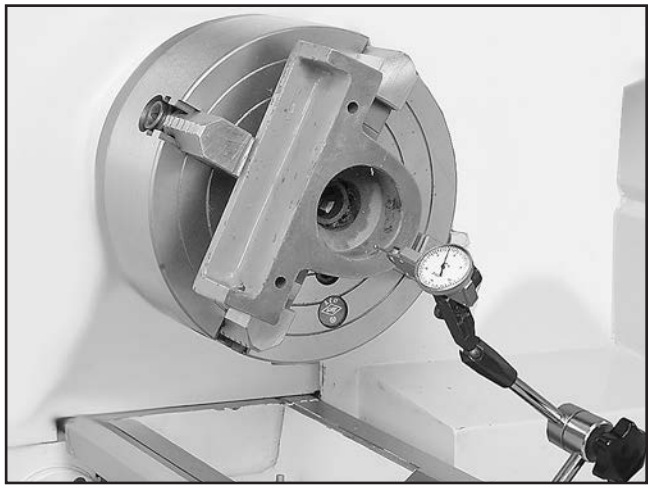


Figure 20. Example of aligning workpiece with a test indicator on a 4-jaw chuck.

⚠WARNING

Always use a low spindle speed when machining non-cylindrical or off-center workpieces to avoid ejecting the workpiece from the holding device at a high rate of speed. Failure to heed this warning could lead to serious personal injury, death or property damage.

Faceplate

The faceplate can be used for mounting non-cylindrical parts or for off-center turning by clamping the workpiece to it. Refer to the **ACCESSORIES** section on **Page 38** for clamping options.

To mount a workpiece to the faceplate:

1. DISCONNECT LATHE FROM POWER!

2. Place a piece of wood below the chuck to protect the bedways.

3. With assistance, place the workpiece onto the faceplate and clamp it in place with a minimum of three independent clamping devices (see **Figure 21** for an example).

   Note: *Take into account the rotation and cutting forces that will be applied to the workpiece when clamping it to the faceplate.*

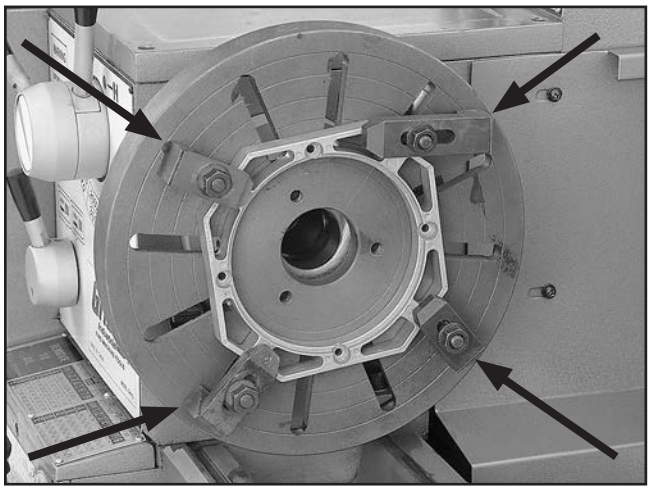


Figure 21. Faceplate with properly mounted workpiece clamped in four locations.

Centers

The Model G9972Z lathe includes an MT#3 dead center for the tailstock quill and an MT#4 dead center for the spindle.

Matching tapers in the spindle and tailstock quill provide the locking action for installing the centers. Before inserting any center or arbor, make sure the mating surfaces are perfectly clean. If oil or grit is present on the mating surfaces, the tapers will not interlock or will be extremely difficult to remove. These parts will last long and remain accurate if properly maintained.

Centers are most often installed in the tailstock quill or used with the faceplate (see **Figure 22** for examples).

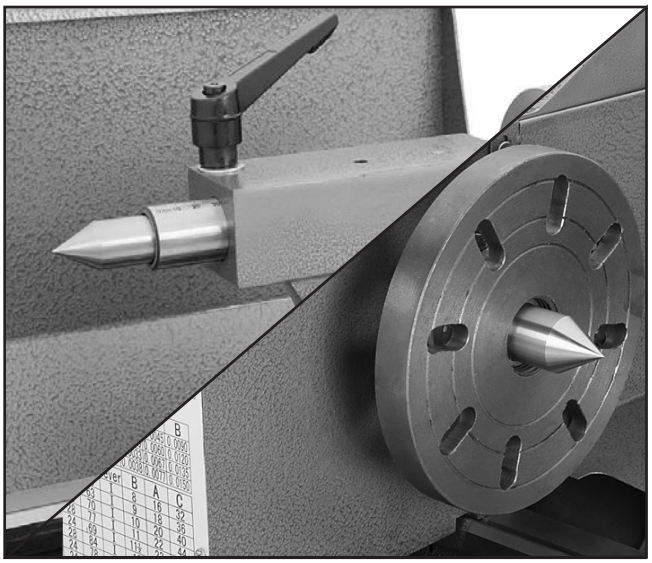


Figure 22. Centers installed in the tailstock quill and the spindle with a faceplate.

Live centers are typically built with bearings and spin during use, so they do not need lubrication. However, dead centers do not spin during use and require the tip to be constantly lubricated with anti-seize grease.

NOTICE

To avoid premature wear of the dead center or damage to the workpiece, always keep the dead center tip well lubricated during use.

Using a Center in the Spindle

1. DISCONNECT LATHE FROM POWER!

2. Thoroughly clean the mating surfaces of the center and spindle, then firmly insert the MT#4 dead center into the spindle.

   Note: *When using the dead center in the spindle, use a lathe dog so that your part will rotate with the spindle.*

3. To remove the center from the spindle, insert a piece of round bar stock or similar tool through the outboard end of the spindle (on the left side of the headstock), then tap the center loose.

   Note: *Hold onto the center as you tap it loose to avoid it dropping it and damaging the tip or the bedways.*

Using a Center in the Tailstock

1. Feed the tailstock quill out about 1", then insert the MT#3 dead center into the quill.

2. Position the tailstock so the center presses against the workpiece, then lock the tailstock in place.

3. Feed the quill and dead center into the workpiece, then lock the quill in place.

   Note: *The force against the mounted workpiece will fully seat the center's taper.*

4. To remove the center from the quill, hold on to the center with one hand, then retract the quill back into the tailstock until the center pops free.

Offsetting Tailstock

The tailstock can be offset slightly to cut shallow tapers. When the tailstock is positioned toward the operator and away from the spindle center line, the machined workpiece end will be smaller in diameter at the tailstock end. Conversely, if the tailstock is positioned away from the operator, the taper will be at the spindle end.

Alternately loosen and tighten the two tailstock adjustment set screws until the desired offset is indicated on the offset scale (see **Figure 23**). To return the tailstock back to the original position, repeat the process until the centered position is indicated on the scale, then perform the **Aligning Tailstock** instructions.

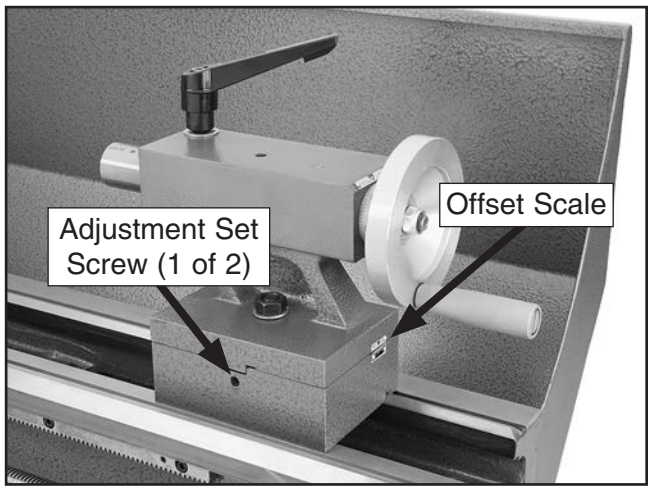


Figure 23. Tailstock offset adjustments.

Aligning Tailstock

The tailstock alignment with the headstock was set at the factory. However, we recommend that you take the time to ensure that the tailstock is aligned to your own desired tolerances.

To align the tailstock:

1. Use a machinist's precision level on the bedways to ensure the lathe is level side-to-side and front-to-back. If the lathe is not level, correct this condition before proceeding (refer to **Moving and Placement** on **Page 12** for detailed instructions).

2. Center drill a 6" long piece of round bar stock on both ends. Set it aside for use in **Step 5**.

   Note: *If the tailstock is slightly out of alignment by a few thousands of an inch, the center drill will find the center point during the drilling process. If the tailstock appears grossly out of alignment, move the tailstock until it appears to be centered (refer to the previous subsection for detailed instructions).*

3. Make a dead center by turning a shoulder on a similar piece of round bar stock, then flip the piece over in the chuck and turn a 60° point (see **Figure 24**).

   Note: *As long as the fabricated dead center remains in the chuck, the point of this center will remain true to the spindle axis or center line. Keep in mind that the point will have to be re-finished whenever it is removed and re-installed in the chuck.*

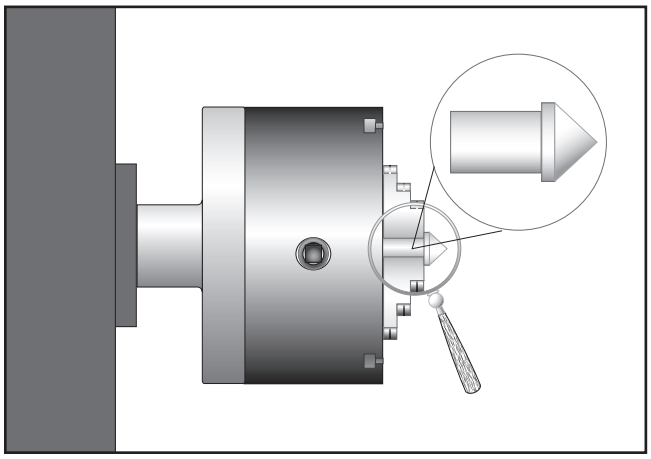


Figure 24. Fabricated dead center.

4. Install the MT#3 dead center in the tailstock quill and lubricate the tip.

5. Attach a lathe dog at the spindle end of the bar stock from **Step 2**, then mount it between the centers (see **Figure 25** for an example).

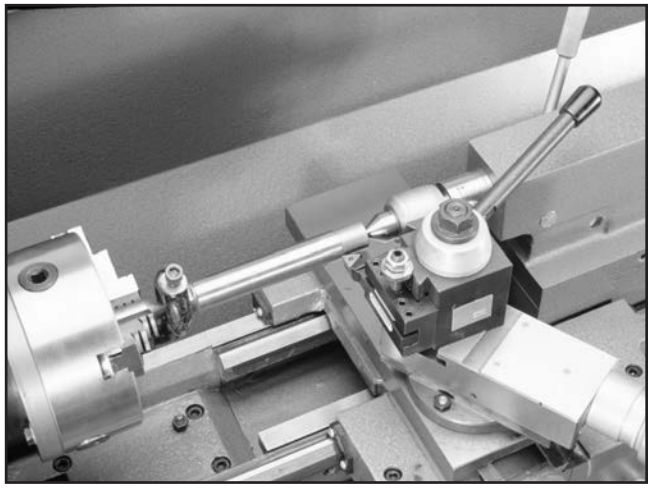


Figure 25. Bar stock mounted between centers.

6. Turn approximately 0.010" off the diameter of the entire length of the workpiece.

7. Mount a dial indicator so that the plunger is on the tailstock barrel.

8. Measure the diameters of both ends of the workpiece.

   —If the machined workpiece is *thicker* at the tailstock end, move the tailstock *toward* the operator *half* the distance of the amount of taper (see **Figure 26**).

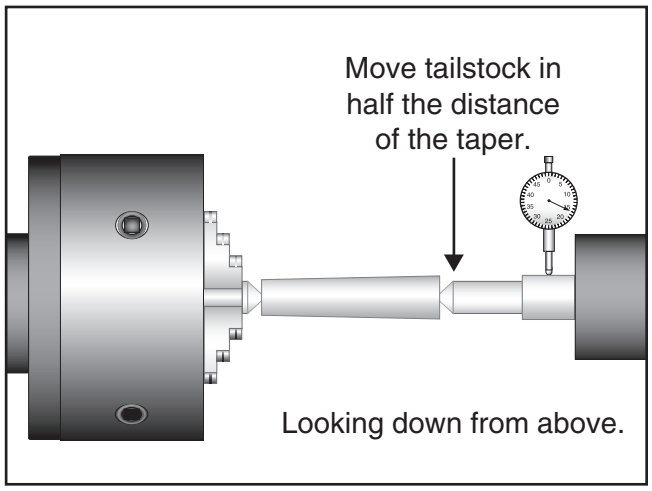


Figure 26. Tailstock adjustment toward the operator (viewed from above).

   —If the machined workpiece is *thinner* at the tailstock end, move the tailstock *away* from the operator *half* the distance of the amount of taper (see **Figure 27**).

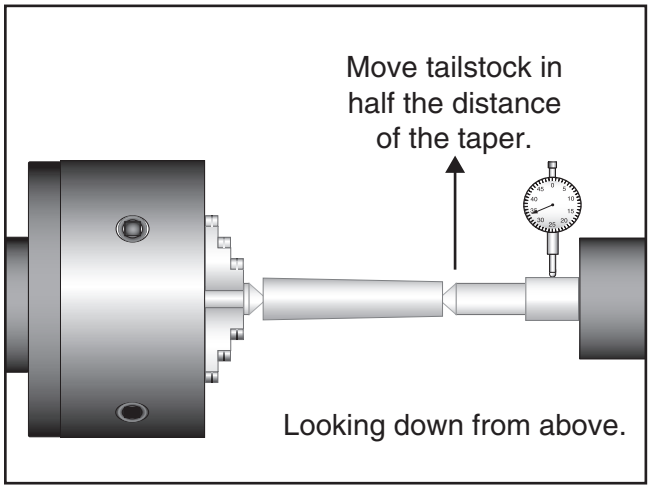


Figure 27. Tailstock adjustment away from the operator (viewed from above).

9. Refer to **Offsetting Tailstock** on **Page 24** for making adjustments to the tailstock position. Turn another 0.010" off the diameter of the workpiece, then re-check the taper. Repeat this process as necessary until the desired amount of accuracy is achieved.

Drilling with Tailstock

The tailstock can be used to drill holes by mounting a drill bit in the tailstock, rotating the workpiece with the spindle, then using the tailstock quill handwheel to advance the drill bit into the workpiece. See **Figures 28–29** for examples of drill chuck and tapered drill bit installation.

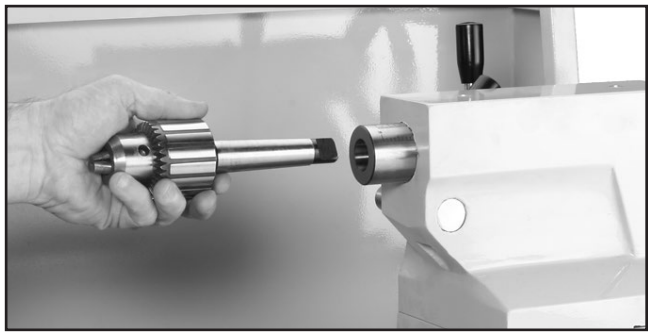


Figure 28. Example of drill chuck installation.

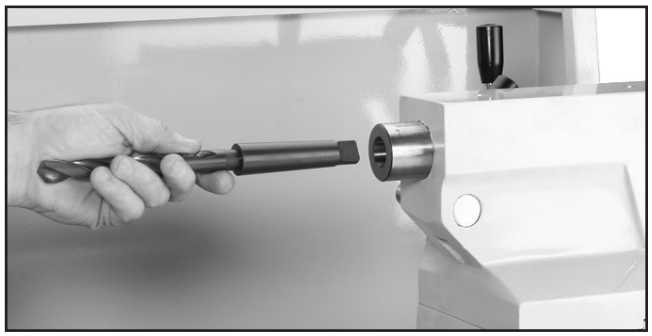


Figure 29. Example of drill bit installation.

Steady Rest

The steady rest serves as a support for long, slender workpieces where the length to diameter ratio is 3:1 or greater. The steady rest can be positioned anywhere along the length of the bedway.

Tools Needed	**Qty**
Wrench 14mm	1

To install and use the steady rest:

1. Remove the clamp hex nut, flat washer, and clamp block from the bottom of the steady rest.

2. Clean away any debris and grime from the bedways, the steady rest ways, and the clamp block.

3. Position the steady rest on the bedway so the triangular notch fits over the rear angled bedway rail, as shown in **Figure 30**, then reinstall and tighten the clamp block.

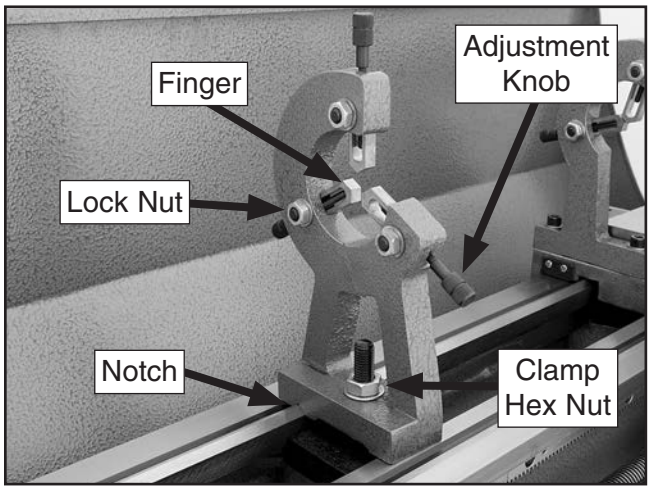


Figure 30. Steady rest controls.

4. Loosen the finger lock nuts, turn the adjustment knobs to fit the fingers snug to the workpiece, then re-tighten the lock nuts.

   Note: *The fingers should be snug enough to fully support the workpiece at all three points and also allow free rotational movement of the workpiece.*

5. Lubricate the finger tips with an anti-seize grease during operation.

   Note: *After prolonged use, the fingers will require milling or filing to clean up the contact surface.*

Follow Rest

The follow rest shown in **Figure 31** is mounted on the front of the saddle and follows the movement of the tool. The follow rest is used on long, slender parts to prevent flexing of the workpiece from the pressure of the cutting tool. This rest requires only two fingers as the cutting tool acts as the third.

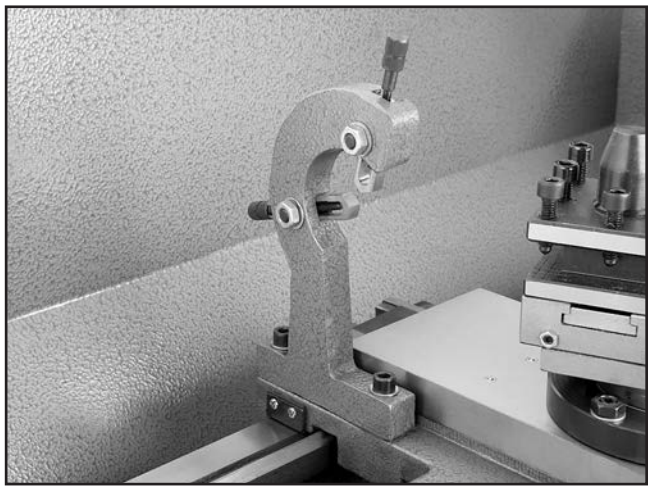


Figure 31. Follow rest attachment.

The follow rest can be attached/removed from the carriage by two cap screws located at the base of the follow rest. The sliding fingers are set similar to those of the steady rest—free of play but not binding. Always lubricate the tips with an anti-seize grease before and during operation. Remove the follow rest from the saddle when not in use. After prolonged use, the fingers will require milling or filing to clean up the contact surface.

Cross Slide

Handwheel Dial Increments	**Resolution**
Each Mark	0.001"
One Revolution	0.060"

The cross slide sits directly on the saddle and moves perpendicular to the workpiece when the handwheel is rotated (see **Figure 32**).

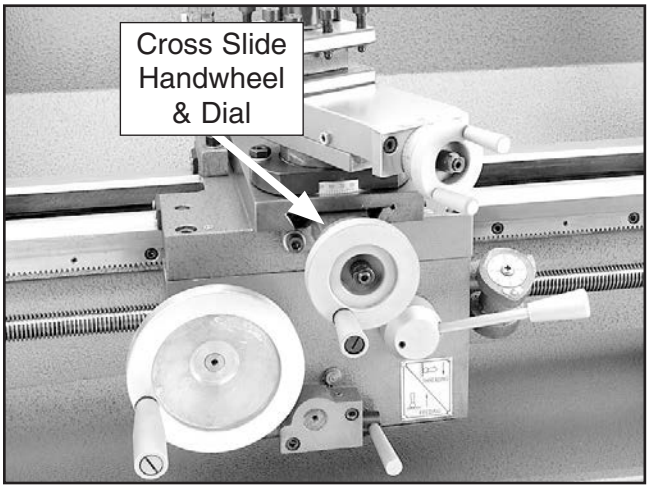
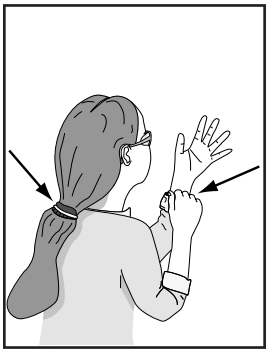


Figure 32. Cross slide handhweel and dial.

Note: *The cross slide graduated dial is a 2:1 dial. The amount removed from the workpiece will be* ***twice*** *the actual distance the cross slide moves.*

For example, if you wanted to remove 0.20" from the diameter of a workpiece, you would move the cross slide only 0.10".



⚠WARNING

The metal lathe represents an entanglement hazard from rotating parts. Always tie back long hair, ponytails, loose clothing, and sleeves, and remove all jewelry.

Compound Slide

Handwheel Dial Increments	Resolution
Each Mark	0.001"
One Revolution	0.040"

The compound slide sits on the cross slide and is the base for the tool post. An important feature of the compound slide is that it can position the cutting tool at angles other than 90° to the workpiece, which is necessary when matching chamfers or when cutting threads.

Tools Needed	Qty
Wrench 14mm	1

To set the compound slide angle:

1. Loosen the two hex nuts on either side of the compound slide (see **Figure 33**).

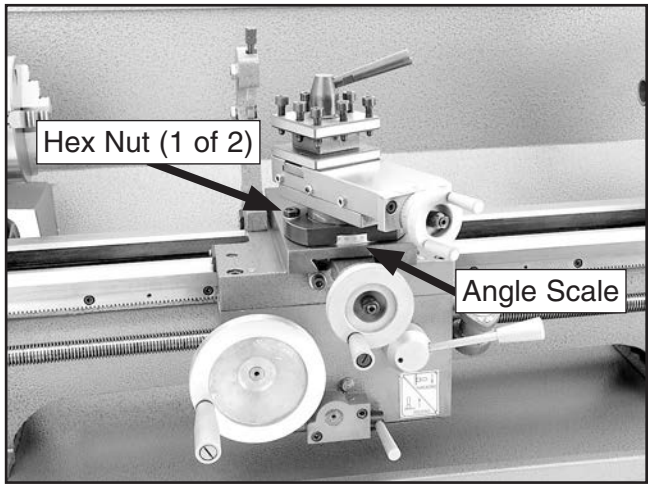


Figure 33. Compound slide angle controls.

2. Use the angle scale shown in **Figure 33** and the indicator mark on the cross slide to rotate the compound slide to the correct angle for your operation.

3. Re-tighten the two hex nuts to secure the slide in place.

Tool Post

The tool post included with the Model G9972Z lathe is a four-way tool post. The tool post is mounted on top of the compound slide, and holds up to four tools at one time that can be indexed (rotated) to the workpiece as needed.

Tools Needed	Qty
Hex Wrench 6mm	1

To load and use the tool post:

1. Loosen the tool post cap screws until the tool fits under the cap screws, as shown in **Figure 34**.

   Note: *To properly secure the tool, make sure a minimum of two post cap screws are holding the tool.*

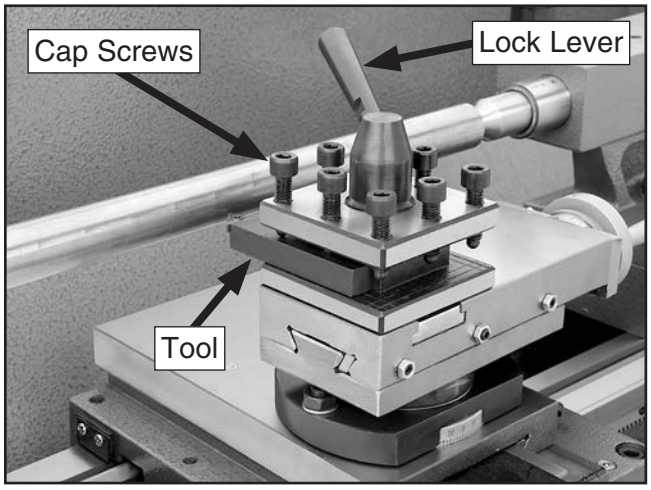


Figure 34. Tool post with a tool mounted.

2. Evenly and firmly tighten the post cap screws until the tool is secure.

3. Repeat **Steps 1–2** for the remaining tools.

4. Loosen the tool post lock lever, rotate the tool post to index the desired tool to the workpiece, then re-tighten the lock lever.

   Note: *The tool post is aligned in four rotational positions by an indexing pin in the compound slide that engages indents in the tool post base.*

Spindle Speed

To set the correct spindle speed for your operation, you will need to: 1) Determine the spindle speed (RPM) needed for your workpiece material, and 2) configure the V-belt for the calculated spindle speed.

Calculating the Correct Spindle RPM

1. Use the table in **Figure 35** to determine the recommended cutting speed for the workpiece material.

   Note: *Cutting speeds are expressed in surface feet per minute (SFM) that the cutter moves against the workpiece.*

Recommended Cutting Speeds		
	Average Tool Speed (sfm)	
Work Material	*Rough Cuts*	*Finish Cuts*
Magnesium	400	800
Aluminum	350	700
Brass & Bronze	250	500
Copper	100	250
Cast Iron (Soft)	100	250
Cast Iron (Hard)	50	150
Mild Steel	100	250
Cast Steel	70	150
Alloy Steels (Hard)	50	150
Tool Steel	50	150
Stainless Steel	60	180
Titanium	90	200
Hi Maganese Steel	40	100
Note: *These values are based on HSS cutting tools. For carbide cutting tools, double the average speed. These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.*		

Figure 35. Recommend cutting speed table.

2. Determine the final diameter, in inches, for the cut you intend to make.

   Note: *For this step, you will need to average out the diameters or work with the finish diameter.*

3. Use the following formula to determine the correct spindle speed (RPM) for your operation:

   Dia. of Cut (in inches) x 3.14 (RPM)

   *Double if using carbide cutting tool

Example A

You will finish cut ½" diameter piece of cast steel stock, using an HSS cutting tool.

Step 1:
150 (SFM from chart) x 4 = 600

Step 2:
600 / .5" (Diameter of workpiece) = 1200

Result:
The correct spindle speed is 1200 RPM.

Example B

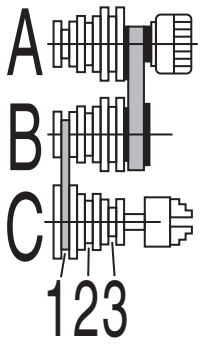
You will rough turn a 1" diameter piece of stainless steel, using a carbide cutting tool.

Step 1:
60 (SFM from chart) x 2 (for carbide tool) = 120

Step 2:
120 (Determined SFM) x 4 = 480

Step 3:
480 / 1" (Diameter of workpiece) = 480 RPM

Result:
The correct spindle speed is 480 RPM.



150	300	560	720	1200	2400
BC1	BC2	BC3	AC1	AC2	AC3

Figure 36. Model G9772Z spindle speed V-belt configuration chart.

⚠WARNING

The V-belt, change gears, and pulleys represent a serious entanglement hazard when the lathe is running. Always disconnect the lathe from power before opening the change gear cover.

Configuring the V-Belt

There are six spindle speeds available by properly positioning the V-belt on the motor, idler, and spindle pulleys.

Tools Needed **Qty**
Wrench 17mm..... 1

To configure the V-belt:

1. DISCONNECT LATHE FROM POWER!

2. Refer to the chart in **Figure 36** above and find the spindle speed on the top row that is closest to your calculated spindle speed.

   Note: *This chart is also on the front of the headstock. In most cases, the calculated spindle speed will be between the available speeds. Use your best judgement when choosing either a higher or lower spindle speed.*

3. Use **Figures 37–38** to identify the "A", "B", and "C" pulleys. Also, note the location of the idler pulley.

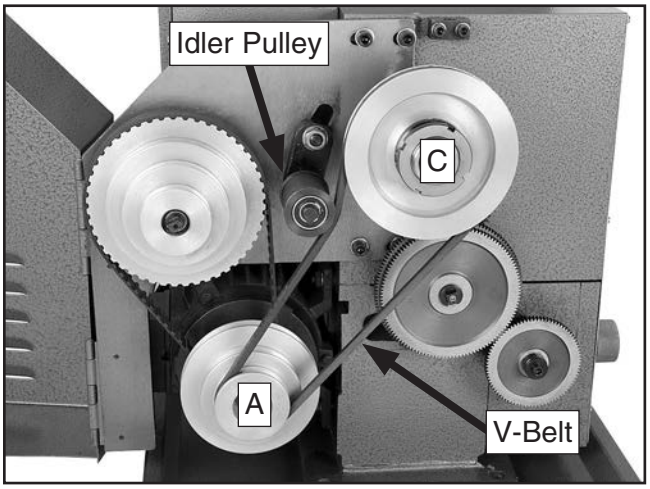


Figure 37. V-belt in the "A–C" configuration.

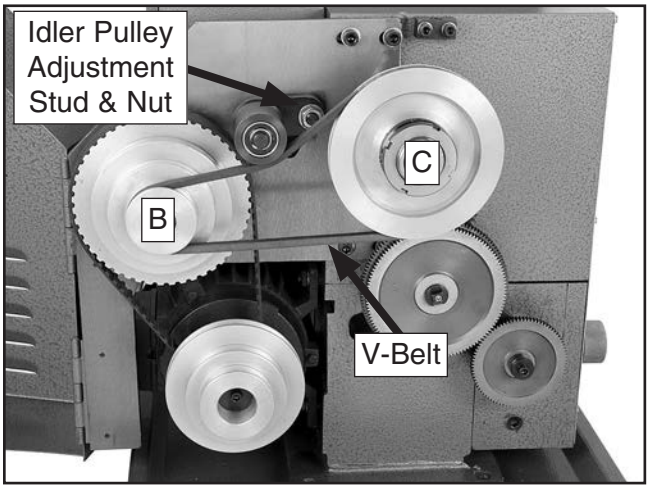


Figure 38. V-belt in the "B–C" configuration.

Note: *There is hex nut on either end of the idler pulley adjustment stud that is loosened when adjusting the idler pulley.*

4. Configure the V-belt on the pulleys according to the letter and number combination under the selected spindle speed from the chart in **Figure 36**.

   Position the idler pulley on top of the V-belt with enough downward pressure to provide tension to the belt, then fully secure it in place. There is correct tension to the V-belt when there is approximately ½" deflection when moderate pressure is applied to the V-belt half-way between the pulleys.

   Note: *The pulley slots are numbered 1–3 with number 1 being the outside slot.*

   —For "A–C" configurations (see **Figure 37**), position the longer V-belt (32" in circumference) in the correct "C" pulley slot, then roll it onto the "A" pulley.

   —For "B–C" configurations (see **Figure 38**), place the shorter V-belt (29" in circumference) in the correct "C" pulley slot, then roll it onto the "B" pulley.

Power Feed

"Power Feed" on a lathe simply means using the machine-driven components to feed the tool into the workpiece rather than feeding it manually with handwheels.

The speed at which the carriage travels is set with the feed rate dials (see **Feed Rate** on **Page 32** for detailed instructions), but it also depends on spindle speed.

NOTICE

Feed rate is based on the spindle speed. High feed rates result in a rapidly moving carriage. Pay close attention to the feed rate you have chosen and keep your hand poised over the power feed lever. Failure to fully understand this could cause the carriage to crash into the spindle or tailstock resulting in severe damage to the lathe.

When the proper feed rate has been selected for the operation, simply move the power feed lever up to engage the carriage with the power feed (see **Figure 39**). Move the lever down to disengage the power feed.

When the spindle is rotating counterclockwise (towards the operator), the carriage will move toward the spindle when engaged with the power feed. Conversely, when the spindle is rotating clockwise (away from the operator), the carriage will move toward the tailstock.

Note: *If the spindle is not turning, you may have to manually jog the carriage to engage the apron gearing with the leadscrew.*

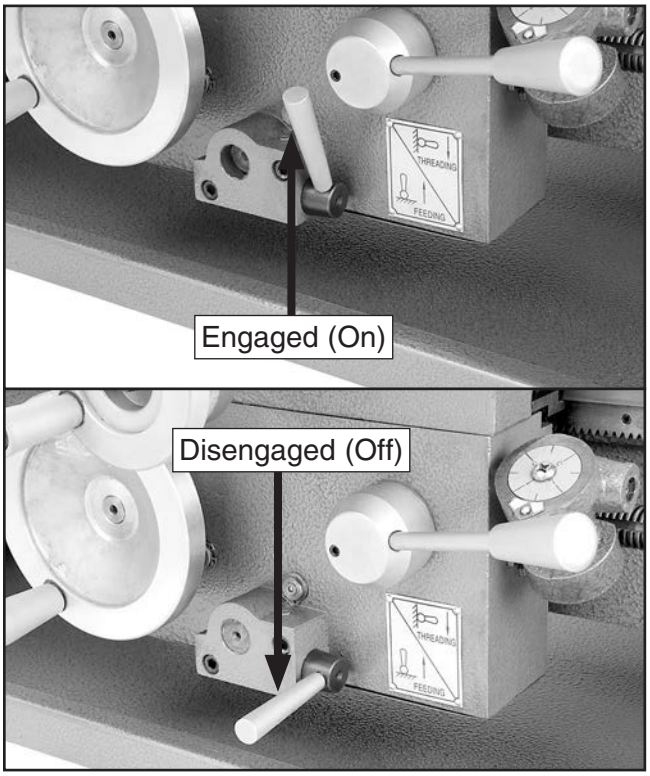


Figure 39. Power feed lever engaged and disengaged.

NOTICE

NEVER attempt to engage the carriage power feed (lever up) and the half-nut (lever down) at the same time. Always disengage the half-nut (lever up) before moving the power feed lever up. Otherwise, severe damage to the lathe could occur.

Feed Rate

Feed rate is the speed the tool travels during the operation and is expressed in inches of carriage travel per revolution of the spindle (IPR), and is set by configuring the change gears and feed rate dials.

The correct feed rate is determined by the workpiece material, the type of tooling used, and the desired finish. The table in **Figure 40** shows the recommended feed rate for turning most metals.

Recommended Feed Rates		
	Tool Feed Rate (IPR)	
Work Material	*Rough Cuts*	*Finish Cuts*
Magnesium	0.015–0.025	0.005–0.010
Aluminum	0.015–0.025	0.005–0.010
Brass & Bronze	0.015–0.025	0.003–0.010
Copper	0.010–0.020	0.004–0.008
Cast Iron (Soft)	0.015–0.025	0.005–0.010
Cast Iron (Hard)	0.010–0.020	0.003–0.010
Mild Steel	0.010–0.020	0.003–0.010
Cast Steel	0.010–0.020	0.003–0.010
Alloy Steels (Hard)	0.010–0.020	0.003–0.010
Tool Steel	0.010–0.020	0.003–0.010
Stainless Steel	0.010–0.020	0.003–0.010
Titanium	0.010–0.020	0.003–0.010
Hi Maganese Steel	0.010–0.020	0.003–0.010
Note: *These values are a guideline only. Refer to the MACHINERY'S HANDBOOK for more detailed information.*		

Figure 40. Recommended feed rate table.

WARNING

The V-belt, change gears, and pulleys represent a serious entanglement hazard when the lathe is running. Always disconnect the lathe from power before opening the change gear cover.

Use **Figure 41** to identify the change gears and their positions.

Note: *This lathe is shipped with the 24 tooth gear installed in the "**a**" position, and the 84 tooth gear in the "**b**" position.*

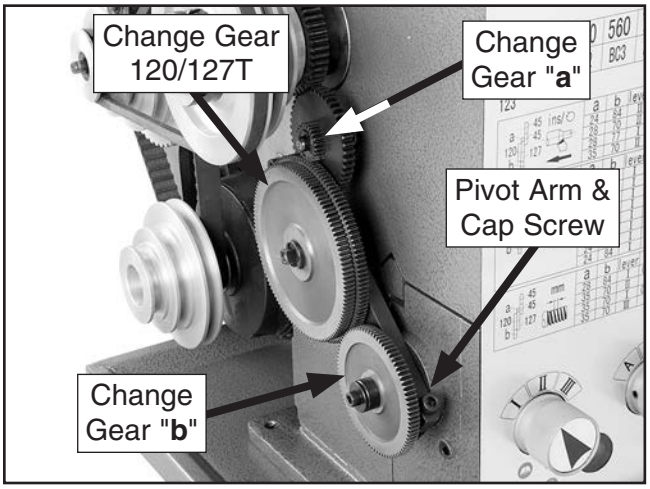
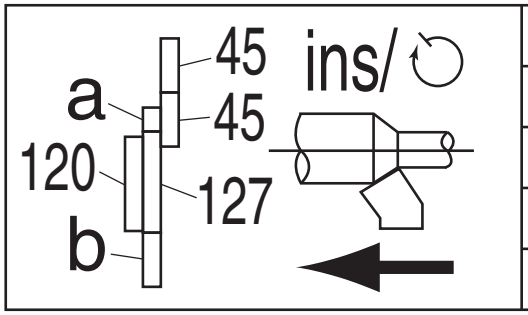


Figure 41. Change gears.



a	b	lever	C	A	B
24	84	II	0.0022	0.0045	0.0090
28	70	II	0.0030	0.0060	0.0120
28	77	I	0.0033	0.0067	0.0135
35	70	II	0.0038	0.0077	0.0150

Figure 42. Feed rate chart for power feed movement of the carriage.

Tools Needed	Qty
Hex Wrench 5mm	1
Hex Wrench 6mm	1
Wrench 10mm	1
Wrench 14mm	1
Retaining Clip Wrench	1
NLGI #2 Grease	As Needed

Configuring Change Gears

1. DISCONNECT LATHE FROM POWER!

2. Examine the chart in **Figure 42** or **Figure 45** to determine the change gear configuration for the selected feed rate.

   Note: *The feed rates are given in inches of carriage travel per revolution of the spindle (IPR).*

3. Open the change gear cover, then arrange the change gears as needed. Leave approximately 0.002"–0.003" (0.05–0.08mm) backlash between the gears.

   Note: *Before you install the gears, thoroughly clean them with a stiff brush and mild solvent, then apply a light coat of NLGI #2 grease to the teeth.*

   Change Gear "a"

   a. Loosen the cap screw securing the pivot arm, then lower it to disengage the 120/127T gear from change gear "**a**" (see **Figure 43**).

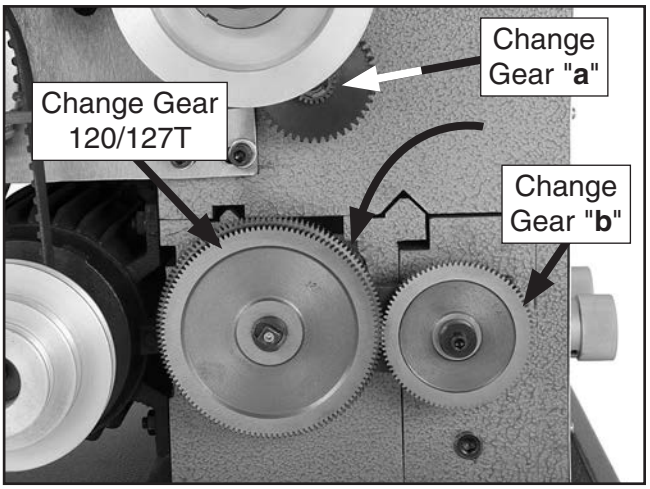


Figure 43. Change gear pivot arm in lowered position.

   b. Remove the E-clip that secures change gear "**a**", replace the gear with correct one, then replace the E-clip.

   c. Raise the pivot arm so that the 120/127T gear properly meshes with change gear "**a**", then re-tighten the cap screw to secure it in place.

   Change Gear "b"

   a. Lower the pivot arm as described above.

   b. Loosen the square nut on the 120/127T gear and slide it along the pivot arm and away from change gear "**b**".

   c. Loosen and remove the cap screw securing change gear "**b**", then remove the flat washer, bushing, and the gear.

   d. Install the correct change gear "**b**", the bushing, flat washer, and cap screw.

   Note: *If change gear "**b**" must mesh with the 120T gear when cutting metric threads, mount the bushing between the gear and the headstock to properly align the gear.*

   e. Slide the 120/127T gear over to properly mesh with change gear "**b**", then re-tighten the square nut.

   f. Raise the pivot arm and secure it in place as described above.

4. Rotate the spindle by hand and make sure all change gears are properly meshed and rotating.

   —If the change gears are not properly meshed or rotating freely, repeat this procedure until they are.

5. Close and secure the change gear cover.

Setting the Feed Rate Dials

1. Make sure the spindle motor is ***OFF*** and the spindle has come to a complete stop.

2. Examine the chart in **Figure 42** or **Figure 45**, then correctly set feed rate dials for your selected feed rate.

NOTICE

NEVER move the feed rate dials while the lathe is running, and NEVER force the dials when shifting. If the dial will not engage, rotate the spindle by hand while keeping light pressure on the dial. As the spindle rotates, the feed rate gears will align and the dial will slip into position.

Example of Setting Feed Rate

You will rough cut the length of an aluminum workpiece, reducing the diameter.

Step 1:
Examine the recommended feed rate table (**Figure 40** on **Page 32**) to find the feed rate should be 0.015–0.025 IPR.

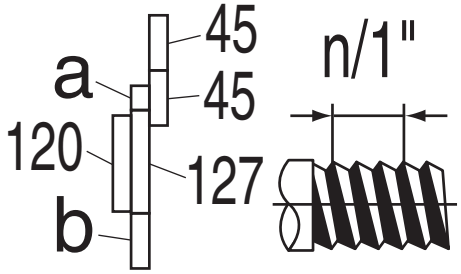
Step 2:
Select the nearest feed rate from the feed rate chart (**Figure 42** on **Page 32**) for the lathe. In this case, it will be 0.0150 IPR.

Step 3:
Install the 35T change gear in position "**a**" and the 70T change gear in position "**b**".

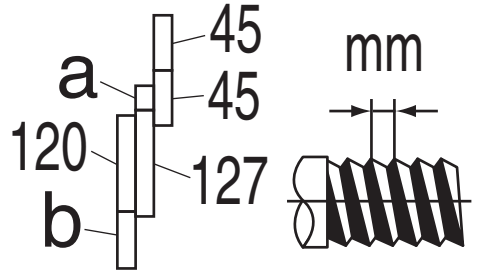
Step 4:
Turn the left feed rate dial to "**II**" and the right dial to "**B**" (see **Figure 44**).

Note: *It may be necessary to jog the spindle by hand to mesh the feed rate gearing and complete the setting of the dials.*

Figure 44. Feed rate dials.



a	b	lever	B	A	C
35	70	I	8	16	32
28	63	I	9	18	36
28	70	I	10	20	40
28	77	I	11	22	44
24	69	I	11½	23	46
28	84	I	12	24	48
24	78	I	13	26	52
24	84	I	14	28	56



a	b	lever	C	A	B
28	84	I	0.50	1.00	2.00
35	70	II		1.25	2.50
35	70	I	0.75	1.50	3.00
35	70	III		1.75	3.50

Figure 45. Feed rate chart for threading.

Threading Controls

The purpose of this subsection is to orient you with the controls used when threading and how to use the threading dial on this machine.

Power Feed Lever

The power feed lever must be in the disengaged position (down and horizontal) for threading operations or the half-nut will not engage with the leadscrew (see **Figure 46**).

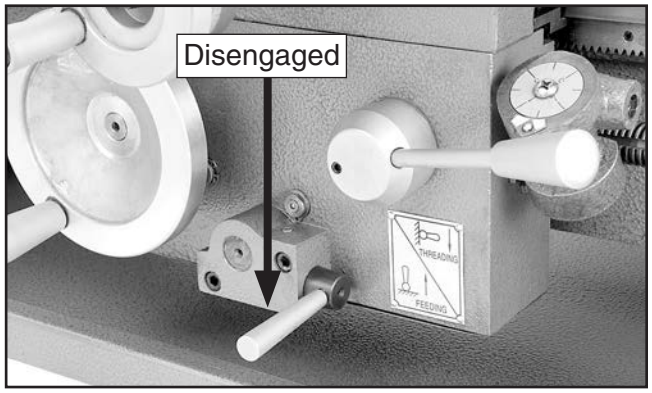


Figure 46. Power feed lever disengaged.

Half-Nut Lever

The half-nut lever engages the carriage with the leadscrew which moves the tool along the workpiece (see **Figure 47**).

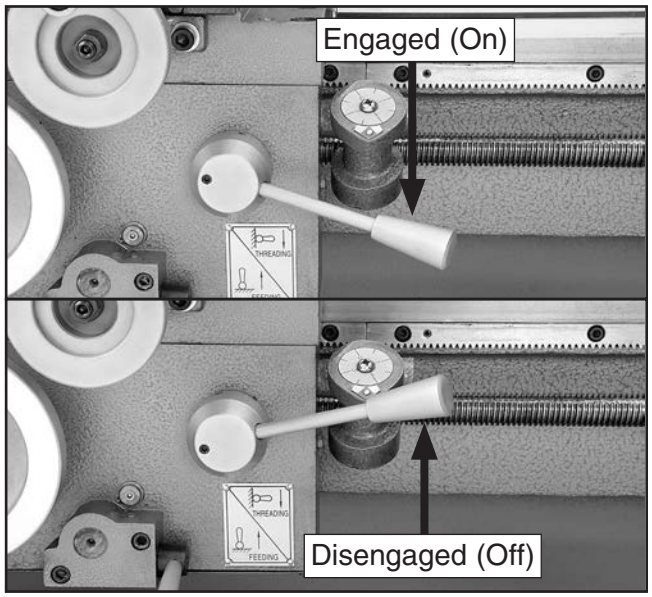


Figure 47. Half-nut lever engaged/disengaged.

Thread Dial & Chart

The numbers on the thread dial are used with the thread dial chart (**Figure 49** on **Page 36**) to show when to engage/disengage the half-nut during inch threading operations.

The thread dial must be engaged with the leadscrew to operate. To engage the thread dial, loosen the mounting cap screw, pivot the thread dial gear onto the leadscrew so the gear teeth mesh with the leadscrew, then re-tighten the cap screw (see **Figure 48**).

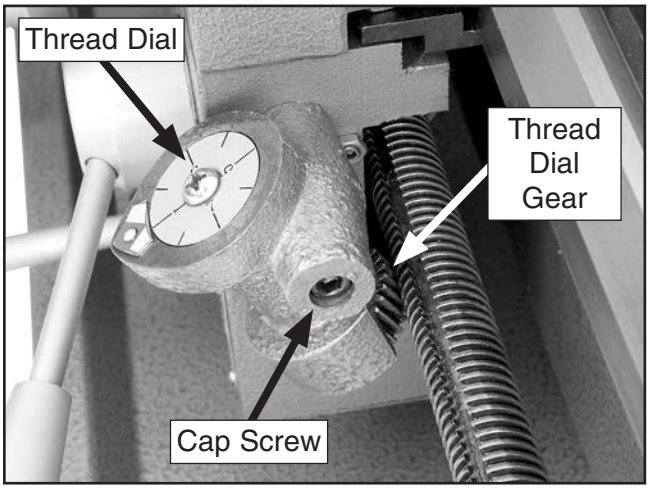


Figure 48. Thread dial.

NOTICE

NEVER attempt to engage the carriage power feed (lever up) and the half-nut (lever down) at the same time, and NEVER force these levers. Always disengage the power feed (lever down) before engaging the half-nut. Otherwise, severe damage to the lathe could occur.

To use the thread chart, find the thread pitch per inch (TPI) on the thread dial chart (see **Figure 49**) that you want to cut and reference the "Dial" number next to it. The dial number(s) indicate when to engage the half-nut when cutting that TPI.

THREAD DIAL	
T.P.I.	DIAL
8 10 12 14 15 18 20 22 24 26 28 30 36 38 40 44 46 48 52 56	1 – 8
9 11 13 19 23	1, 3 5, 7
$9^1/_2$-$11^1/_2$	2, 6

Figure 49. Thread dial chart.

For example, to cut a TPI of 11, engage the half-nut when the thread dial pointer is on the 1, 3, 5, or 7. To cut a TPI of 24, engage the half-nut on any number between 1 and 8.

To maintain accuracy and consistency, engage the half-nut on the same thread dial number on each pass. Failure to start on the same number each time may lead to cutting off the thread made in the previous pass.

Note: *The thread dial is not used when cutting metric threads. Leave the half-nut engaged until the threads are complete.*

NOTICE

DO NOT engage the half-nut when the spindle speed is over 300 RPM. Ignoring this instruction could result in damage to the leadscrew or carriage components.

H6879—Lathe Operation & Maintenance Book
This detailed metal lathe book provides extensive coverage of a wide variety of metalworking operations. Special emphasis is placed on lathe components, accessories, and operating procedures, including basic machine setup and routine maintenance. A "must have" reference for all metal lathe owners. 260 pages.

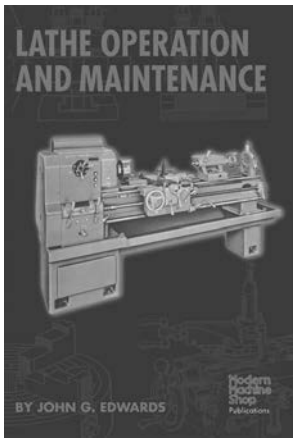


Figure 50. H6879 Lathe Operation & Maintenance Book.

H2670—HSS Square Tool Bits
Our ground tool bits are M-2 HSS, making them some of the most durable tool bits around. Make your own specialized cutters in any shape using a silicon carbide grinding wheel (G8235-37) on your grinder.

Figure 51. H2670 HSS Square Tool Bits.

H8257—Primrose Armor Plate with Moly-D Machine and Way Oil 1 Quart
This superior machine and way lubricant prevents stick slip and chatter due to anti-friction capabilities resulting in greater precision machining capabilities. Provides the thinnest oil film possible while effectively providing needed lubrication and rust/corrosion protection. Adhesive/cohesive components are added for vertical surfaces. Resists squeeze out, running, dripping and non-gumming.

"This is good stuff! I use it on my lathes at home."
S. Balolia – President

Figure 52. Primrose Armor Plate Lubricant.

G9849—Magnetic Base/Dial Indicator Combo
Precision measurements and setups have never been so easy. Magnetic base engages with just the turn of a switch and allows pinpoint adjustment. The dial indicator features 0–1" travel and has a resolution of 0.001". This fine set includes a molded case for protection and convenience.

Figure 53. G9849 Magnetic Base/Dial Indicator Combo.

Call 1-800-523-4777 To Order

G1070—MT3 Live Center Set
A super blend of quality and convenience, this live center set offers seven interchangeable tips. High-quality needle bearings prolong tool life and special tool steel body and tips are precision ground. Supplied in wooden box.

Figure 54. G1070 Live Center Set.

H7540—Metalworking Kit No. 1
Get started with the practical lathe kit that includes the following hand essentials:

- Double-ended boring bar with holder and two ¼" HSS tool bits
- Two round head fly cutters
- Six-head knurling tool
- Double-ended knurling tool
- Straight turning tool holder with 5⁄16" HSS tool bit
- Cut-off tool holder with three HSS blades
- Hex wrenches
- Protective wooden case

Figure 55. Model H7540 Metalworking Kit No. 1.

G1075—52-PC. Clamping Kit, ½" T-Nut
Our clamping kits are among the best in the world! All the blocks, bolts, nuts, and hold-downs are case hardened. This clamping kit includes: 24 studs, 6 step block paris, 6 T-nuts, 5 flange nuts, 4 coupling nuts, and 6 end hold-downs. The rack can be bolted to the wall or side of the machine for easy access.

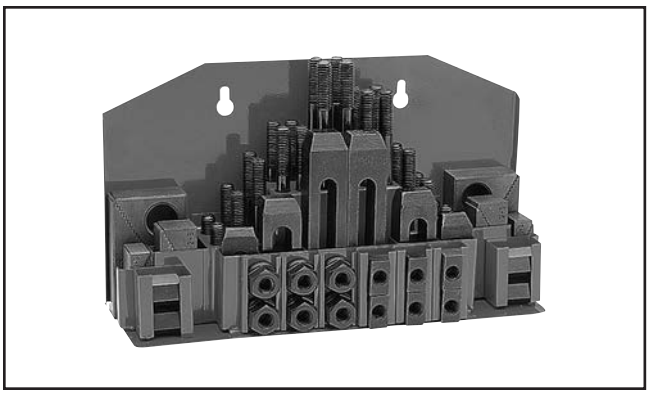


Figure 56. G1075 52-PC. Clamping Kit.

G9256—6" Dial Caliper
G9257—8" Dial Caliper
G9258—12" Dial Caliper
These traditional dial calipers are accurate to 0.001" and can measure outside surfaces, inside surfaces, and heights/depths. Features stainless steel, shock resistant construction and a dust proof display. An absolute treat for the perfectionist!

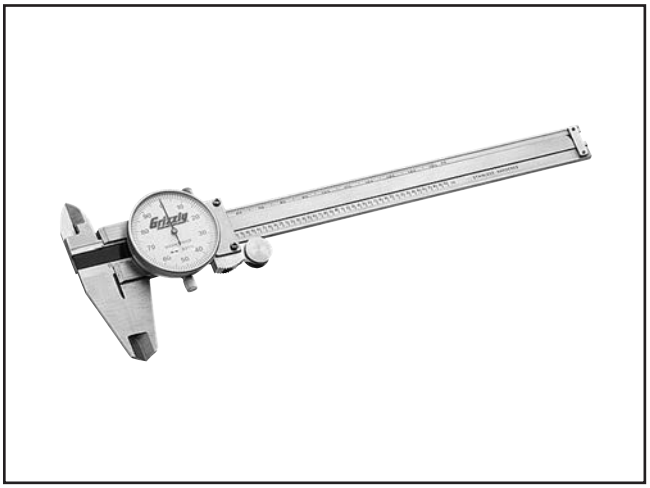


Figure 57. Grizzly® Dial Calipers.

Call 1-800-523-4777 To Order

H2972—Cut Off Holder with Blade
H4268—3/32" x 5/8" x 5" Replacement Blade
Small enough to fit most 4-way turret tool posts, but rugged enough to handle the job, this cut-off tool holder is a must. Comes with a wrench and cut-off tool bit. Uses 3/32" x 5/8" x 5" tool bits. Shank measures ½" x ¼" x 3".

Figure 58. H2972 Cut Off Holder with Blade.

H2996—Double Ended Boring Bar
This is a well made boring bar and holder. The boring bar holds the tool bit at 90˚ at one end and 45˚ at the other. Comes with a wrench and tool bit. Bar size is 3/8" x 4½", holder is 2¼" x ½", uses 1/8" tool bits.

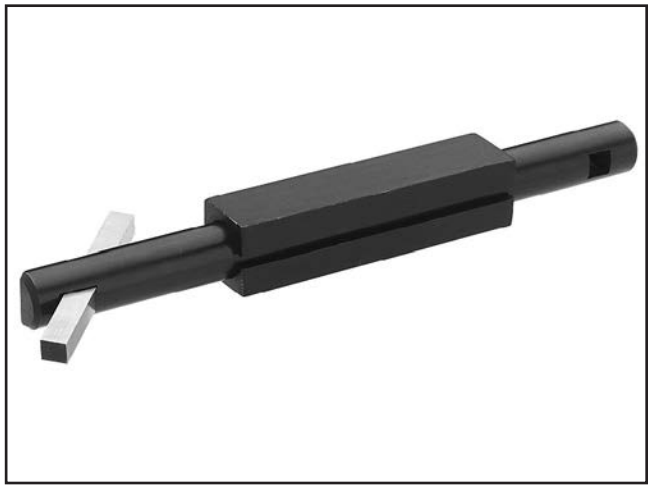


Figure 59. H2996 Double Ended Boring Bar.

H5936—2 Pc. Knurling Tool Set
This 2 piece set includes a ½" x 4" Single Knurling Tool Holder and a ½" x 4½" Double Knurling Tool Holder with Pivoting Head. Both have a black oxide finish.

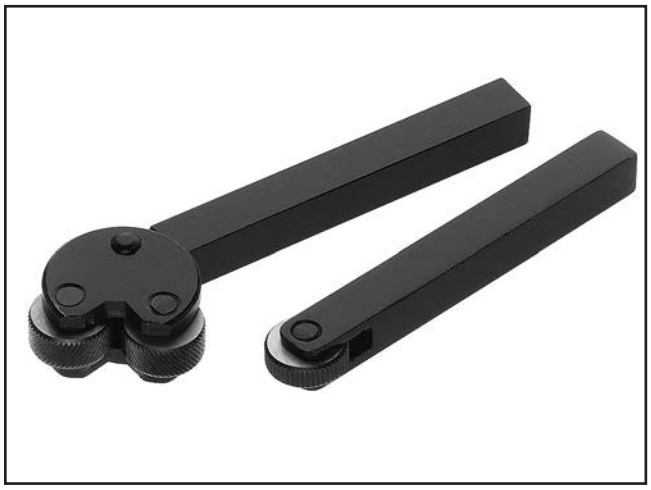


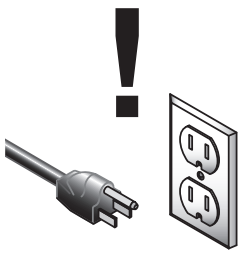
Figure 60. H5936 2 Pc. Knurling Tool Set.

H2987—½" Bent Lathe Dog
Just the thing for precision machining between centers! These bent tail Lathe Dogs are made of durable cast iron and feature square head bolts.

Figure 61. H2987-91 Lathe Dogs.

Call 1-800-523-4777 To Order

SECTION 6: MAINTENANCE



⚠WARNING

Always disconnect power to the machine before performing maintenance. Failure to do this may result in serious personal injury.

Schedule

For optimum performance from your machine, follow this maintenance schedule and refer to any specific instructions given in this section.

Daily Check:
- Loose mounting bolts.
- Damaged or worn belts.
- Worn or damaged wires.
- Any other unsafe condition.

Every 6–8 Hours of Operation:
- Clean lathe.
- Lubricate lathe (**Pages 41–44**).

After First Three Months and Annually:
- Change feed rate gearbox oil (**Page 42**).

Cleaning & Protecting

- Disconnect the lathe from power before cleaning.

- Vacuum excess metal chips as they accumulate and wipe off built-up grime.

⚠CAUTION

DO NOT use compressed air to blow away chips from the lathe to avoid the risk of flying metal debris injuring yourself or others, or driving the chips deep into the lathe mechanisms resulting in damage or premature wear.

- Use a dry cloth to wipe off any remaining coolant at the end of the day. Metal chips soaked with water-based coolant left on the machine will invite oxidation and gummy residue to build up around moving parts.

- Follow Federal, State, and the manufacturer's requirements to properly dispose of used coolant and cleaning products

- Protect the unpainted metal surfaces on the lathe by wiping them clean at the end of operations. Keep these surfaces, especially the bedways, rust-free and working smoothly with regular applications of products like Model H8257 Primrose Armor Plate with Moly-D Machine and Way Oil (see **ACCESSORIES** on **Page 37**).

Lubrication

Your lathe has numerous moving metal-to-metal contacts that require proper lubrication to help ensure efficient and long-lasting operation.

Other than the lubrication points covered in this section, all other bearings are internally lubricated and sealed at the factory. Simply leave them alone unless they need to be replaced.

Before adding lubricant, clean away any debris and grime from the lubrication point to avoid contaminating the lubricant and increasing wear of the moving parts.

DISCONNECT THE LATHE FROM POWER BEFORE PERFORMING LUBRICATION!

Ball Oilers

Lubricant	Frequency	Qty
ISO 68 or Equivalent Lubricant	Every 8 Hours of Operation	1 squirt from Oil Can

Wipe clean and lubricate the ball oilers shown in **Figures 62–66**. To insert the oil, depress the ball with the tip of an oil can and squirt once.

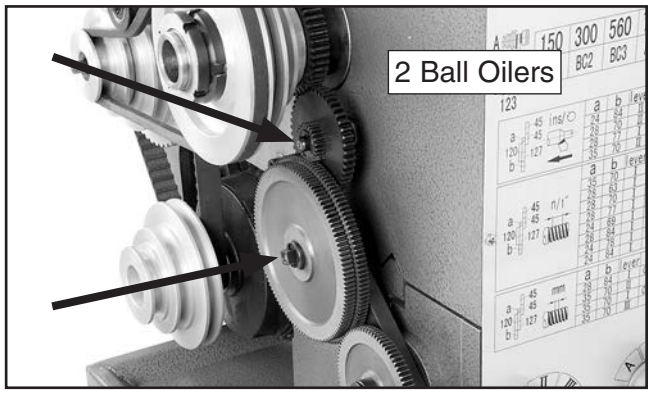


Figure 62. Change gear ball oilers.

NOTICE

Follow reasonable lubrication practices as outlined in this manual for your lathe. Failure to do so could lead to premature failure of your lathe and will void the warranty.

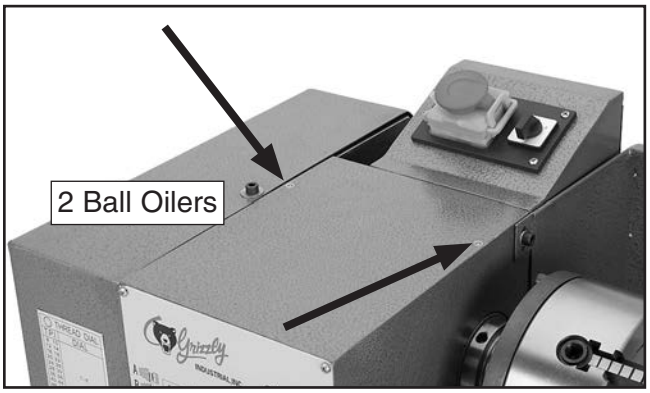


Figure 63. Spindle bearing ball oilers.

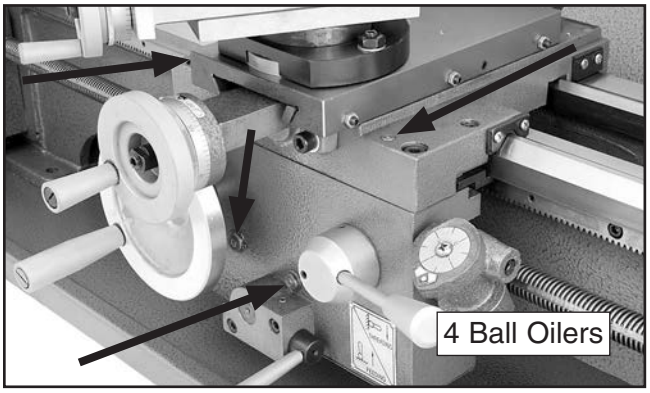


Figure 64. Apron ball oilers.

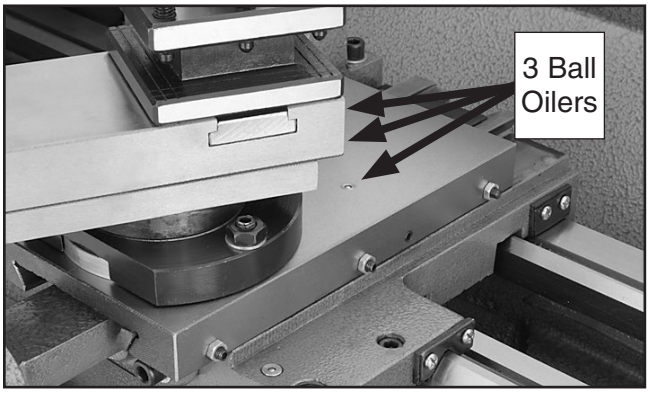


Figure 65. Cross slide ball oilers (one in view).

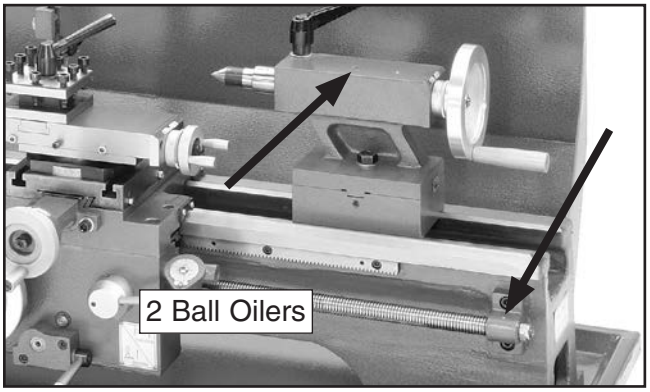


Figure 66. Tailstock quill and leadscrew ball oilers.

Feed Rate Gearbox Oil Reservoir

Lubricant	Frequency	Qty
ISO 68 or Equivalent Lubricant	Check/ Fill Every 8 Hours of Operation	Half-Way Mark in Sight Glass

The feed rate gearbox oil reservoir must be checked and oil added, if necessary, on a daily basis.

Tools Needed **Qty**
Hex Wrench 8mm..... 1

To check and add oil to the reservoir:

1. Check the oil reservoir sight glass shown in **Figure 67**. If the oil level is below the half-way mark, continue with the following steps to add oil.

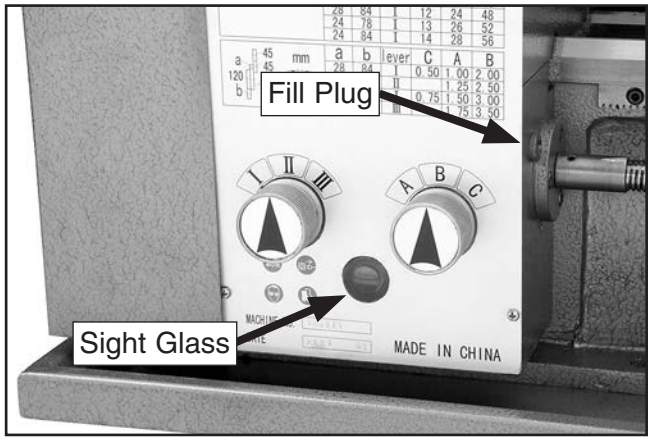


Figure 67. Feed rate gearbox oil reservoir sight glass and fill plug.

2. Wipe clean the area around the fill plug to prevent debris from falling into the reservoir when adding oil.

3. Remove the fill plug.

4. Slowly add oil until the level is centered in the sight glass.

5. Replace the fill plug.

NOTICE

The feed rate gearbox oil must be changed after the first three months of operation, then annually after that.

Tools Needed **Qty**
Hex Wrench 8mm..... 1
Drain Pan (at least 1 Gallon Capacity)..... 1

To change the oil in the reservoir:

1. DISCONNECT LATHE FROM POWER!

2. Open the change gear cover on the left of the headstock.

3. Remove the reservoir fill plug (see **Figure 67**).

   Note: *If you are experiencing difficulty removing the fill plug, do not remove the drain plug to drain the reservoir until you can successfully remove the fill plug. This way you can still operate the lathe until the issue is resolved.*

4. Hold the drain pan under the reservoir drain plug, then remove the drain plug shown in **Figure 68**, and allow the oil to completely drain into the pan.

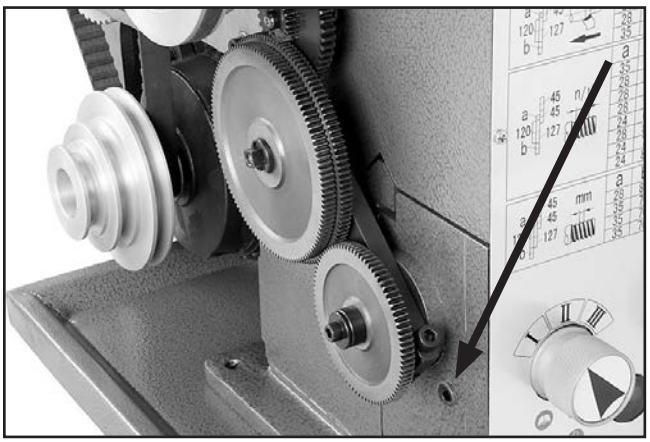


Figure 68. Feed rate gearbox oil reservoir drain plug.

5. While holding the pan under the drain hole, pour approximately ½ quart of clean oil into the reservoir to flush out any sediment from along the bottom.

6. Re-install the drain plug and add oil to the reservoir until the oil level is centered in the sight glass.

7. Re-install the fill plug and close the change gear cover.

Longitudinal Leadscrew & Carriage Rack

Lubricant	Frequency	Qty
ISO 68 or Equivalent Lubricant	Every 8 Hours of Operation	Thin Coat

Maintain a thin coat of oil on the longitudinal leadscrew threads and the carriage rack (see **Figure 69**) at all times. Use a stiff brush and mild solvent to remove any debris or grime before using a clean shop rag to wipe on the oil.

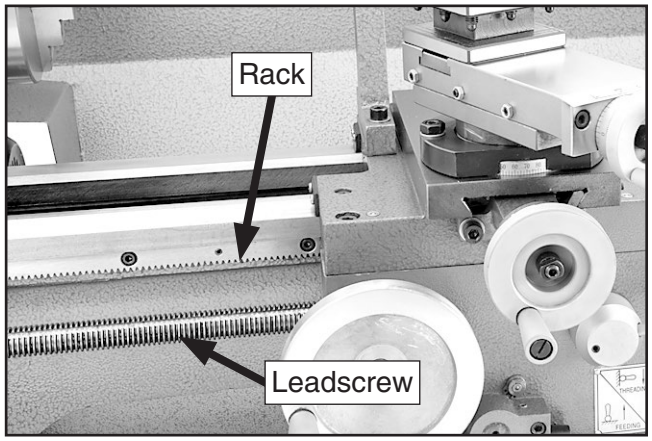


Figure 69. Longitudinal leadscrew and carriage rack.

Compound Slide

Lubricant	Frequency	Qty
Way Oil	Every 8 Hours of Operation	Thin Coat

Maintain a thin coat of way oil on the slide surface of the compound slide. Use the handwheel to move the compound slide all the way toward you (see **Figure 70**), then wipe clean the bottom slide with a rag and mild solvent. Apply the lubricant and move the compound slide back and forth to distribute the oil.

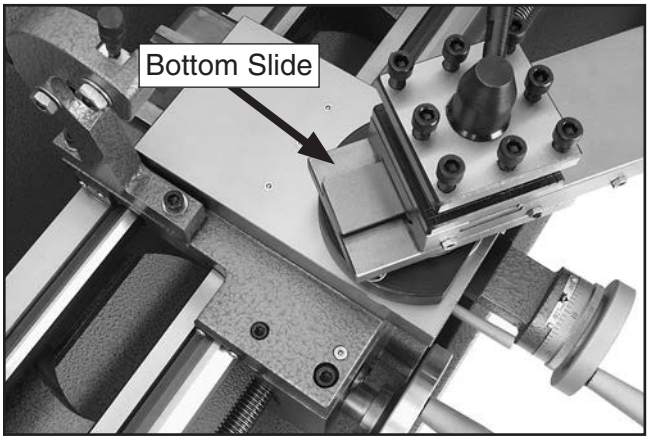


Figure 70. Compound bottom slide.

Feed Lever Plunger

Lubricant	Frequency	Qty
ISO 68 or Equivalent Lubricant	Every 8 Hours of Operation	1 squirt from Oil Can

Wipe clean the feed lever plunger shown in **Figure 71**, then apply the lubricant. With the machine ***OFF***, move the feed lever up and down to distribute the oil.

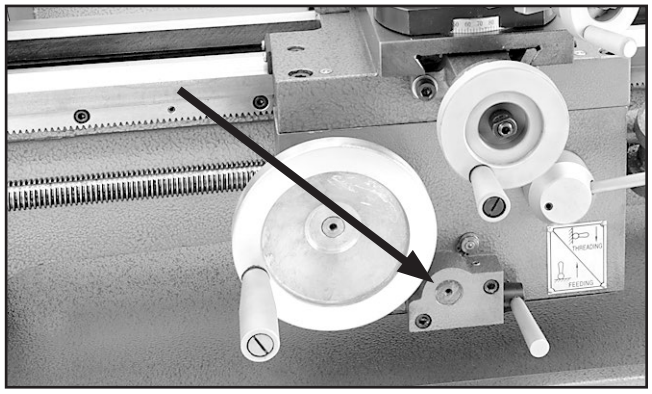


Figure 71. Feed lever plunger.

Bedways

Lubricant	Frequency	Qty
Way Oil	Every 8 Hours of Operation	Thin Coat

To keep the bedways rust-free and components sliding smoothly along the surface, maintain a thin coat of way oil on the bedway. Move the steady rest, carriage, and tailstock to access the entire length of the bedway.

We recommend using Model H8257 Primrose Armor Plate with Moly-D Machine and Way Oil (see **ACCESSORIES** on **Page 37**).

Change Gears

Lubricant	Frequency	Qty
NLGI #2 Grease	Check/Add Every 8 Hours of Operation	Thin Coat

Maintain a thin coat of grease on the change gear teeth. Move the V-belt away from the gears, then use a stiff brush and a mild solvent to clean debris and grime from the gears. Use a clean, dry rag to wipe off the solvent. Brush on a thin coat of lubricant to the teeth and rotate the spindle by hand to distribute the grease.

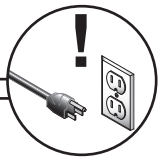
NOTICE

Follow reasonable lubrication practices as outlined in this manual for your lathe. Failure to do so could lead to premature failure of your lathe and will void the warranty.

SECTION 7: SERVICE

Review the troubleshooting and procedures in this section to fix or adjust your machine if a problem develops. If you need replacement parts or you are unsure of your repair skills, then feel free to call our Technical Support at (570) 546-9663.

Troubleshooting



Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start or a breaker trips.	1. Plug or receptacle is at fault or wired incorrectly. 2. Start capacitor is at fault. 3. Wall fuse or circuit breaker is blown or tripped. 4. Motor connection is wired incorrectly. 5. Power supply is at fault, or is switched OFF. 6. Motor ON/OFF button is at fault. 7. Centrifugal switch is at fault. 8. Spindle switch is at fault. 9. Cable or wiring is open or has high resistance. 10. Motor is at fault.	1. Test power plug and receptacle for good contact and correct wiring. 2. Test capacitor and replace if necessary. 3. Make sure circuit breaker/fuse is sized correctly for machine load; replace faulty breaker. 4. Correct motor wiring (**Page 55**). 5. Make sure all hot lines and grounds are operational and have correct voltage. 6. Replace faulty motor ON/OFF button. 7. Adjust/replace. 8. Test; replace if necessary. 9. Troubleshoot wires for internal/external breaks; check for disconnected or corroded connections; repair or replace faulty wiring or connections. 10. Test/repair/replace.
Machine has vibration or noisy operation.	1. Motor or component is loose. 2. V-belt worn, damaged, or loose. 3. Motor fan is rubbing on fan cover. 4. Pulley set screws or keys are missing or loose. 5. Machine is incorrectly mounted. 6. Cutting tool is chattering. 7. Workpiece or chuck is at fault. 8. Spindle bearings are at fault. 9. Motor bearings are at fault. 10. Gears are at fault.	1. Inspect/replace stripped or damaged fasteners; re-tighten with thread locking fluid. 2. Replace/re-tension V-belt (**Page 30**). 3. Repair/replace dented fan cover or fan. 4. Inspect set screws/keys; replace/tighten if necessary. 5. Re-tighten/replace machine mounting hardware as necessary; use shims where required. 6. Re-sharpen/replace cutting tool; index tool to workpiece; use correct feed rate and spindle speed. 7. Re-center and properly secure workpiece in chuck or faceplate; replace defective chuck/faceplate. 8. Tighten/replace spindle bearings (**Page 51**). 9. Rotate motor shaft to check for noisy or burnt bearing; repair/replace as necessary. 10. Replace bad gears/bearings.

Motor & Electrical (continued)

Symptom	Possible Cause	Possible Solution
Machine stalls or is overloaded.	1. Wrong workpiece material.	1. Only process metal that has the correct properties for your type of machining.
	2. Workpiece alignment is at fault.	2. Re-center and properly secure workpiece in chuck or faceplate.
	3. Incorrect spindle speed for task.	3. Correctly set V-belt for your operation (**Page 29**).
	4. Low power supply.	4. Make sure all hot lines and grounds are operational and have correct voltage.
	5. Run capacitor is at fault.	5. Test and replace if necessary.
	6. V-belt is slipping.	6. Check V-belt and re-tension; replace if necessary (**Page 30**).
	7. Plug or receptacle is at fault.	7. Test power plug and receptacle for good contact and correct wiring.
	8. Motor connection is wired incorrectly.	8. Correct motor wiring (**Page 55**).
	9. Motor bearings are at fault.	9. Rotate motor shaft to check for noisy or burnt bearing; repair/replace as necessary.
	10. Machine is undersized for the task.	10. Use sharp cutting tools at the correct angle, reduce feed rate or depth of cut, and use coolant if possible.
	11. Motor has overheated.	11. Clear obstacles away from the motor fan cover, let motor cool, and reduce workload on machine.
	12. Spindle switch is at fault.	12. Test; replace if necessary.
	13. Motor is at fault.	13. Test/repair/replace.
	14. Centrifugal switch is at fault.	14. Adjust/replace.

Operations

Symptom	Possible Cause	Possible Solution
Bad surface finish.	1. Incorrect spindle speed or feed rate. 2. Dull tool or poor tool selection. 3. Too much play in gibs. 4. Tool too high.	1. Adjust for proper spindle speed and feed rate (**Pages 29–32**). 2. Use sharp tools; use correct tool for the operation. 3. Adjust gibs (**Page 49**). 4. Lower tool position.
Cannot remove tapered tool from tailstock quill.	1. Quill not retracted all the way back into the tailstock. 2. Debris/oil not removed from tapered mating surfaces before inserting into quill.	1. Rotate the quill handwheel until the tapered tool is forced out of quill. 2. Always make sure that tapered mating surfaces are clean before inserting.
Gear(s) will not line up and mesh.	1. Gear(s) not aligned in headstock.	1. Rotate spindle by hand until gear(s) falls into place.
Cutting tool or machine components vibrate excessively during cutting.	1. Tool holder not tight enough. 2. Cutting tool too far out from holder; lack of support. 3. Too much play in gibs. 4. Cutting tool is dull. 5. Incorrect spindle speed or feed rate.	1. Check for debris, clean, and re-tighten. 2. Re-install cutting tool with no more than ⅓ of total length is sticking out of tool holder. 3. Adjust gibs (**Page 49**). 4. Sharpen/replace. 5. Adjust for proper spindle speed and feed rate (**Pages 29–32**).
Cross/compound slide or carriage feed has sloppy operation.	1. Too much play in gibs. 2. Handwheel(s) loose. 3. Too much leadscrew backlash (cross slide only). 4. Leadscrew mechanism worn or out of adjustment.	1. Adjust gibs (**Page 49**). 2. Tighten handwheel fasteners. 3. Adjust leadscrew backlash (**Page 48**). 4. Tighten any loose fasteners on leadscrew mechanisms; check for excessive wear/replace if necessary.
Cross/compound slide or carriage feed hard to move.	1. Gibs are loaded up with chips/grime. 2. Gibs are too tight. 3. Leadscrew backlash setting too tight (cross slide only). 4. Bedways are dirty/dry. 5. Gearing is at fault.	1. Remove gibs, clean ways, lubricate, and properly adjust gibs (**Page 49**). 2. Adjust gibs (**Page 49**). 3. Properly adjust cross slide leadscrew backlash (**Page 48**). 4. Clean and lubricate bedways. 5. Inspect/replace gearing.
Inaccurate turning results from one end of workpiece to the other.	1. Tailstock not properly aligned with headstock.	1. Properly align tailstock with headstock (**Page 24**).
Chuck jaws will not move or do not move easily.	1. Chips/debris lodged in jaws.	1. Remove jaws, clean and lubricate jaws, scroll-gear threads, and chuck, then replace jaws.
Tailstock quill will not feed out of tailstock.	1. Quill lock is tightened down.	1. Turn quill lock counterclockwise to loosen.

Cross Slide Backlash Adjustment

Backlash is the amount of play in a leadscrew. It is felt when turning a handwheel in one direction, then turning it in the other direction. The distance that the handwheel moves without moving the leadscrew or components is the backlash.

When adjusting backlash, tighten the components enough to remove excessive backlash, but not so much that the components bind the leadscrew, making it hard to turn. Overtightening will cause excessive wear to the sliding block and leadscrew.

Tools Needed	**Qty**
Hex Wrench 4mm	1
Hex Wrench 5mm	1
Wrench 14mm	1

To adjust the cross slide backlash:

1. Loosen the hex nuts and remove the set screws and flat washers that secure the compound slide to the cross slide (see **Figures 72–73**).

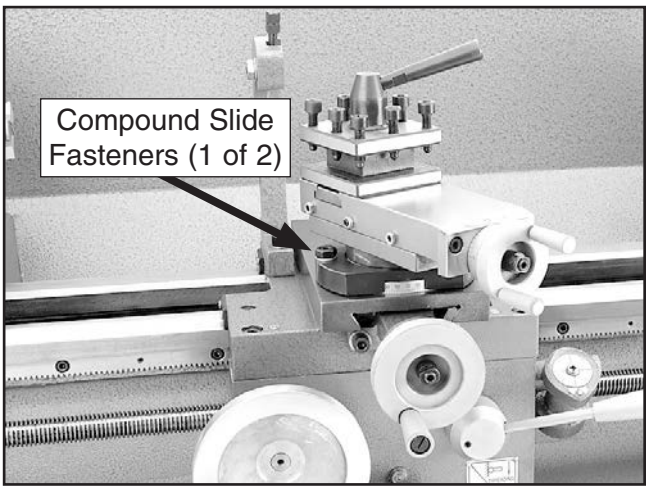


Figure 72. Compound slide fasteners.

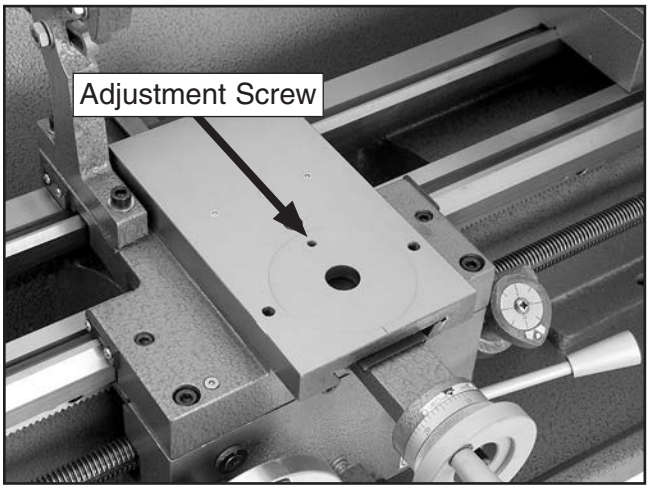


Figure 73. Cross slide backlash adjustment set screw (compound slide removed).

2. Remove the compound slide and place it in a clean, stable location.

3. Adjust the backlash adjustment cap screw shown in **Figure 73** in small increments.

   Note: *Turn the adjustment screw clockwise to reduce backlash and counterclockwise to increase it.*

4. Test after each adjustment by rotating the handwheel back-and-forth until the backlash amount is acceptable.

5. Re-install the compound slide.

Gib Adjustments

The gibs on the Model G9972Z control the accuracy of the cross slide and compound slide movements. These gibs are sliding plates that either increase or decrease pressure on the sliding components around them.

The goal of gib adjustment is to remove unnecessary sloppiness without causing the ways to bind. Tight gibs make the movements more accurate, but harder to perform. Loose gibs make the movements sloppy, but easier to perform.

NOTICE

Excessively loose gibs may cause poor workpiece finishes, and may cause undue wear of the sliding surfaces and ways. Over-tightening the gibs may cause premature wear of these sliding surfaces.

Tools Needed	**Qty**
Wrench 8mm	1
Hex Wrench 2.5mm	1

To adjust the cross slide and compound slide gibs:

1. DISCONNECT LATHE FROM POWER!

2. Loosen the three hex nuts on the side of the slide (see **Figures 74–75**).

Figure 74. Cross slide gib adjustment hex nuts and set screws.

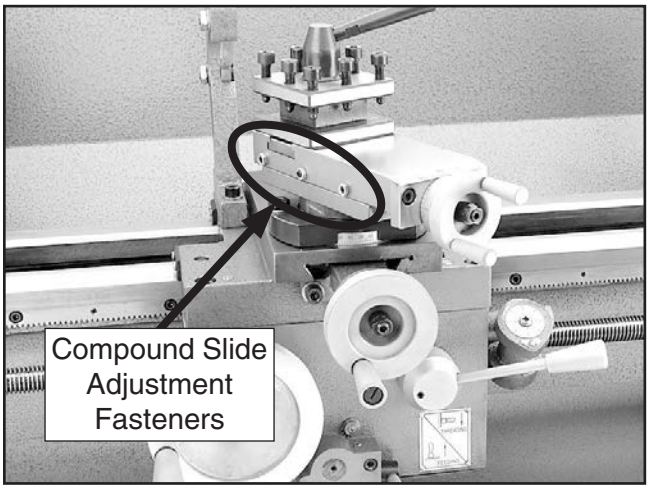


Figure 75. Compound slide gib adjustment hex nuts and set screws.

3. Make adjustments in small and equal increments to the three set screws, then test the movement of the slide by rotating the handwheel.

   Note: *Turning the set screws clockwise will tighten the gib, and turning them counter-clockwise will loosen the gib.*

4. When you are satisfied with the gib adjustment, keep the set screws from moving and re-tighten the hex nuts to secure the settings.

5. Re-check the movement of the slide and, if necessary, repeat **Steps 2–4**.

Half-Nut Adjustment

Over time and with normal wear, the half-nut may become excessively loose when it engages the leadscrew. The half-nut gib is a flat bar that exerts pressure against the half-nut mechanism. The goal of the half-nut adjustment is to remove unnecessary looseness as the half-nut engages the leadscrew without binding it so tight that the half-nut will not release and possibly cause damage to the lathe.

Tools Needed	Qty
Wrench 8mm	1
Hex Wrench 5mm	1
Hex Wrench 2.5mm	1

To adjust the half-nut:

1. DISCONNECT LATHE FROM POWER!

2. Move the half-nut lever up to disengage the half-nut from the leadscrew, then remove the thread dial from the apron.

3. Loosen the two adjustment hex nuts, then adjust the set screws in small increments (see **Figure 76**).

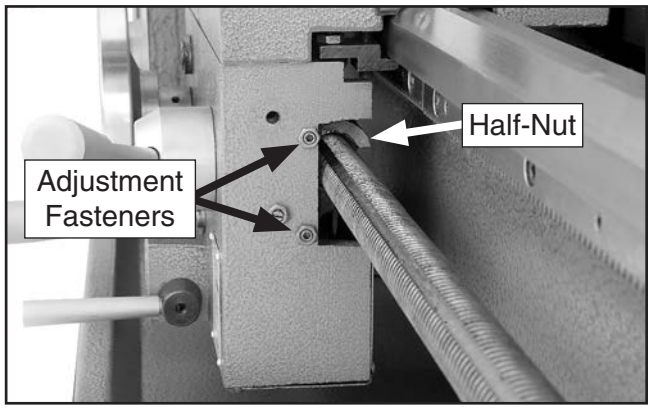


Figure 76. Half-nut gib adjustment hex nuts and set screws (thread dial removed).

5. Engage the half-nut with the leadscrew, then manually rock the carriage back-and-forth while observing the half-nut for looseness.

6. When you are satisfied with the adjustment, keep the set screws from moving while you re-tighten the hex nuts, then re-install the thread dial.

Shear Pin Replacement

The longitudinal leadscrew is secured to the feed rate gearing in the headstock with the use of a soft-metal shear pin (see **Figure 77**). The shear pin is designed to break and disengage power to the leadscrew to help protect more expensive lathe components if you crash your carriage or take too large of a cut and overload the lathe.

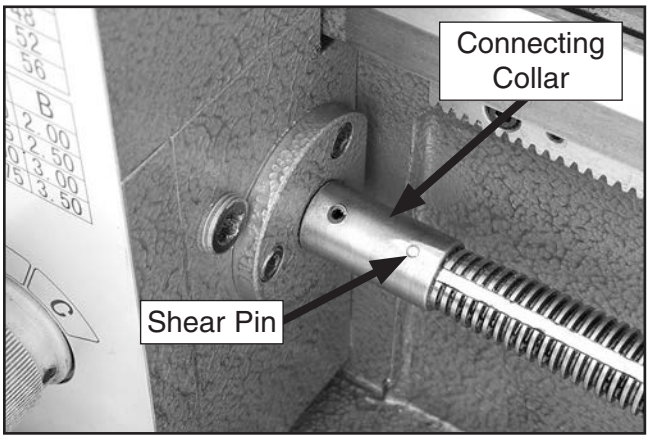


Figure 77. Longitudinal leadscrew shear pin.

Tools Needed	Qty
Hammer	1
Punch 2.5mm	1

To replace the shear pin:

1. DISCONNECT LATHE FROM POWER!

2. Rotate the leadscrew so the shear pin faces up and down. If the connecting collar rotates independently from the leadscrew, then rotate the collar so the shear pin holes align with those in the leadscrew.

3. Use the punch and hammer to drive out the pieces of the old shear pin.

4. Make sure the holes in the collar and leadscrew are aligned, then tap the new shear pin completely through the holes in the collar and leadscrew.

Ribbed Belt Replacement

The ribbed belt transfers power from the motor to the secondary drive pulley (see **Figure 78**). If the ribbed belt becomes excessively worn or damaged, you will need to replace it.

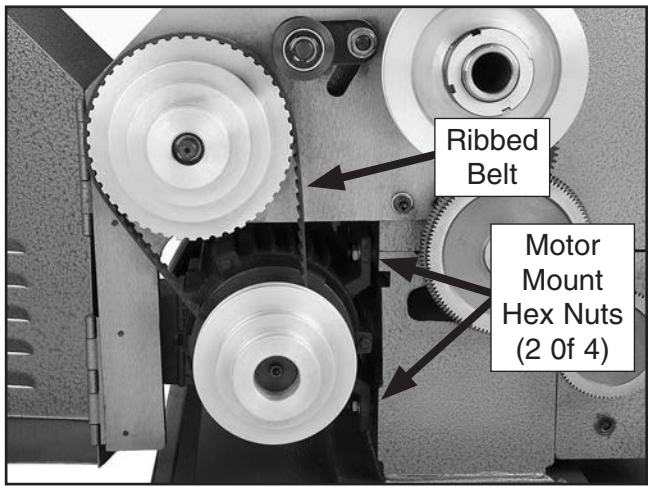


Figure 78. Ribbed belt and motor mount hex nuts.

Tools Needed	Qty
Hex Wrench 5mm (optional)	1
Wrench 14mm	1

To replace the ribbed belt:

1. DISCONNECT LATHE FROM POWER!

2. Open the change gear cover and remove the V-belt.

3. Loosen the four motor mount hex nuts and raise the motor up.

   Note: *It may be more convenient to access the motor mount hex nuts if you first remove the rear splash guard.*

4. Roll the old ribbed belt off the pulleys and replace it with a new one, making sure that the belt ribs are seated in the pulley indents.

5. Lower the motor to produce reasonable tension on the ribbed belt, then re-tighten the motor mount hex nuts.

6. Re-install the V-belt and close the cover.

Bearing Preload

This lathe is shipped from the factory with the spindle bearing preload properly adjusted. If the spindle ever develops excessive end-play and the workpiece finish suffers, you can adjust the bearing preload to remove the unnecessary end-play and improve the workpiece finish.

Tools Needed	Qty
Spanner Wrench 2"	1
Large Phillips Screwdriver	1
Dial Indicator with Magnetic Base	1
Heavy Dead Blow Hammer	1
Wooden Block	1

To adjust the spindle bearing preload:

1. Run the lathe for approximately 20 minutes on high speed to bring the lathe to normal operating temperature.

2. DISCONNECT LATHE FROM POWER!

3. Remove the chuck or faceplate from the spindle, then open the change gear cover to expose the outboard end of the spindle (see **Figure 79**).

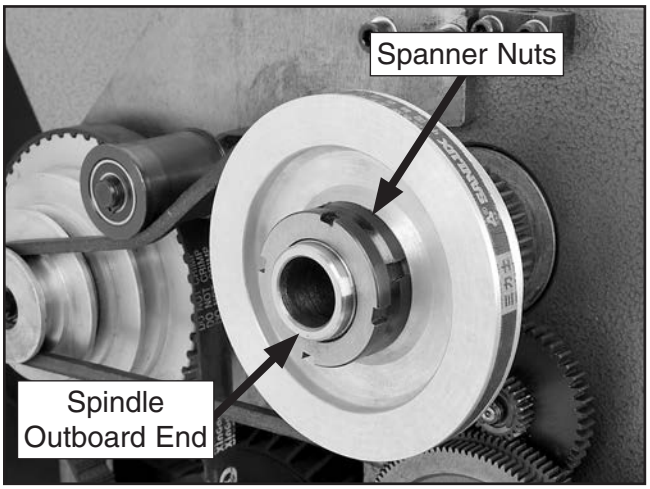


Figure 79. Outboard end of spindle and spanner nuts.

4. Insert the handle of a chuck key or similar tool in a spindle indent to keep the spindle from rotating, then remove the outer spanner nut (see **Figure 79**).

5. Loosen the inner spanner nut one full turn counterclockwise.

   Note: *You may have to tap on the outboard spindle tube as explained in **Step 6** to help unload the spindle preload and break the spanner nut loose.*

6. Place a wooden block over the outboard end of the spindle, and hit it soundly with the heavy dead blow hammer (see **Figure 80**). Your goal is to slide the spindle forward just enough to introduce spindle end-play that you can feel by hand.

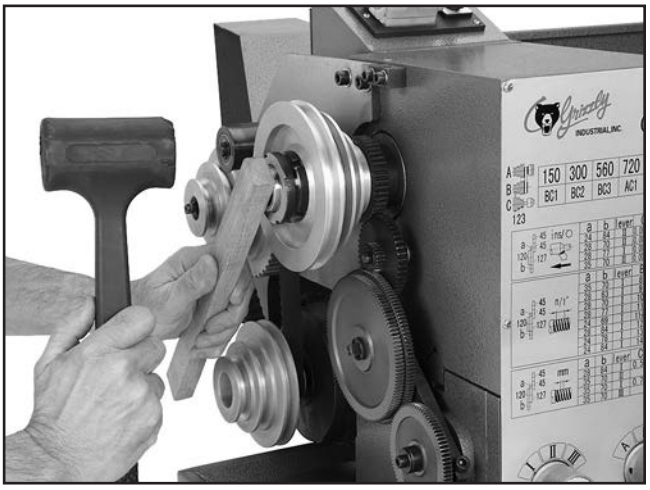


Figure 80. Producing detectable spindle end-play.

7. Place a dial indicator on the cross slide and move the carriage toward the spindle until the contact point of the indicator lightly touches the spindle face and the dial reads exactly zero (see **Figure 81**).

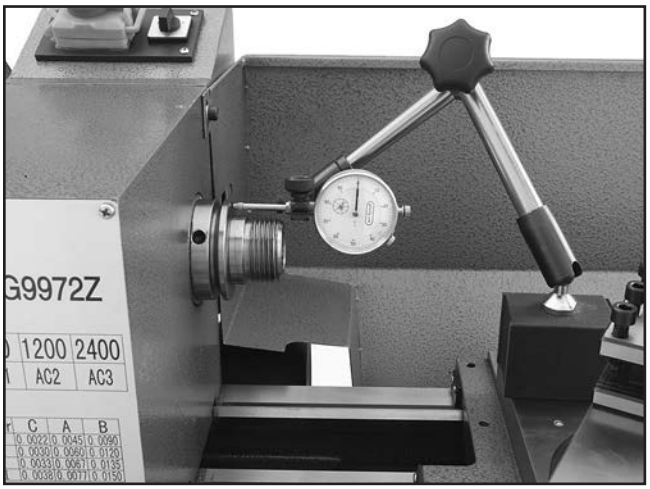


Figure 81. Dial indicator setup.

8. Move the carriage an additional 0.100" toward the headstock.

9. Insert the handle of a chuck key or similar tool in the spindle indents to keep the spindle from rotating, then tighten the inner spanner nut until the indicator dial needle just stops moving and is back to exactly zero.

   Note: *While tightening the spanner nuts, rock the spindle back and forth slightly to make sure the spindle tapered roller bearings seat properly in their races.*

   When the dial indicator needle stops moving, there will be no spindle end-play and no bearing preload. It is *essential* that you find this point without tightening the spanner nut too much and inadvertently preloading the spindle bearings.

Since it takes great effort to turn the inner spanner nut, you may find it difficult to know if you have gone past the zero end-play point or not. It is easiest to have someone watch the dial while you tighten the inner spanner nut. If you think you may have gone past the zero end-play point, take the time to unload the bearings as described earlier, then re-tighten the inner spanner nut until you know you have reached the correct setting.

10. When you are confident that you have adjusted the inner spanner nut until zero spindle end-play and preload exist, tighten the inner spanner nut an additional ⅛" of a turn clockwise to introduce the correct amount of spindle bearing preload (see **Figure 82**).

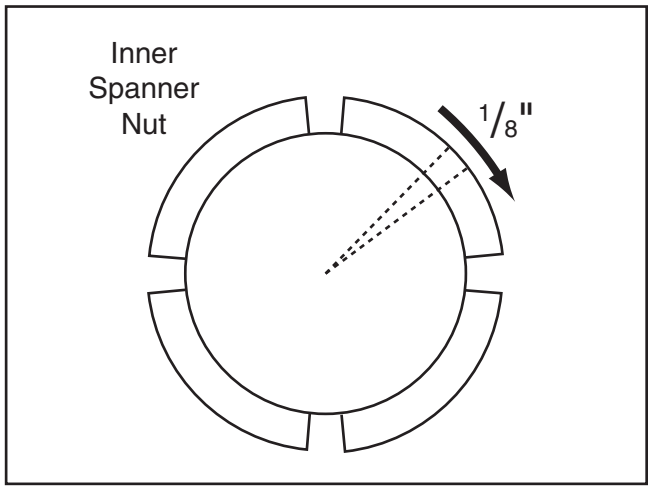


Figure 82. Turning inner spanner nut ⅛" clockwise.

11. Without causing the inner spanner nut to tighten any farther, install and tighten the outer spanner nut against the inner nut.

NOTICE

Do not overtighten the outer spanner nut because additional pressure can force the bearings even tighter against the races in the headstock and cause the headstock to compress, crack, or cause bearing failure.

To confirm that the spindle bearings are correctly preloaded:

1. Re-attach all removed lathe components and prepare it for operation.

2. Install the chuck and tighten the jaws into the center.

3. Set the spindle speed to a medium setting.

4. Connect the lathe to power and turn the lathe spindle ***ON***.

5. Let the lathe run for 20 minutes.

6. Turn the spindle ***OFF***, disconnect the lathe from power, remove the chuck, then check the temperature of the spindle.

—If the spindle nose is slightly warm to the touch, you have correct bearing preload.

—If the spindle nose is hotter than you can comfortably keep your hand on, the preload is too tight and you must repeat the bearing preload adjustment procedure. When repeating the procedure, rotate the inner spanner nut a little less during **Step 10** in the preceding instructions.

SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Study this section carefully. If there are differences between your machine and what is shown in this section, call Technical Support at (570) 546-9663 for assistance BEFORE making any changes to the wiring on your machine.

⚠WARNING
Wiring Safety Instructions

SHOCK HAZARD. Working on wiring that is connected to a power source is extremely dangerous. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. Disconnect the power from the machine before servicing electrical components!

MODIFICATIONS. Modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire. This includes the installation of unapproved aftermarket parts.

WIRE CONNECTIONS. All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.

CIRCUIT REQUIREMENTS. You MUST follow the requirements at the beginning of this manual when connecting your machine to a power source.

WIRE/COMPONENT DAMAGE. Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components.

MOTOR WIRING. The motor wiring shown in these diagrams is current at the time of printing but may not match your machine. If you find this to be the case, use the wiring diagram inside the motor junction box.

CAPACITORS/INVERTERS. Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

EXPERIENCING DIFFICULTIES. If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

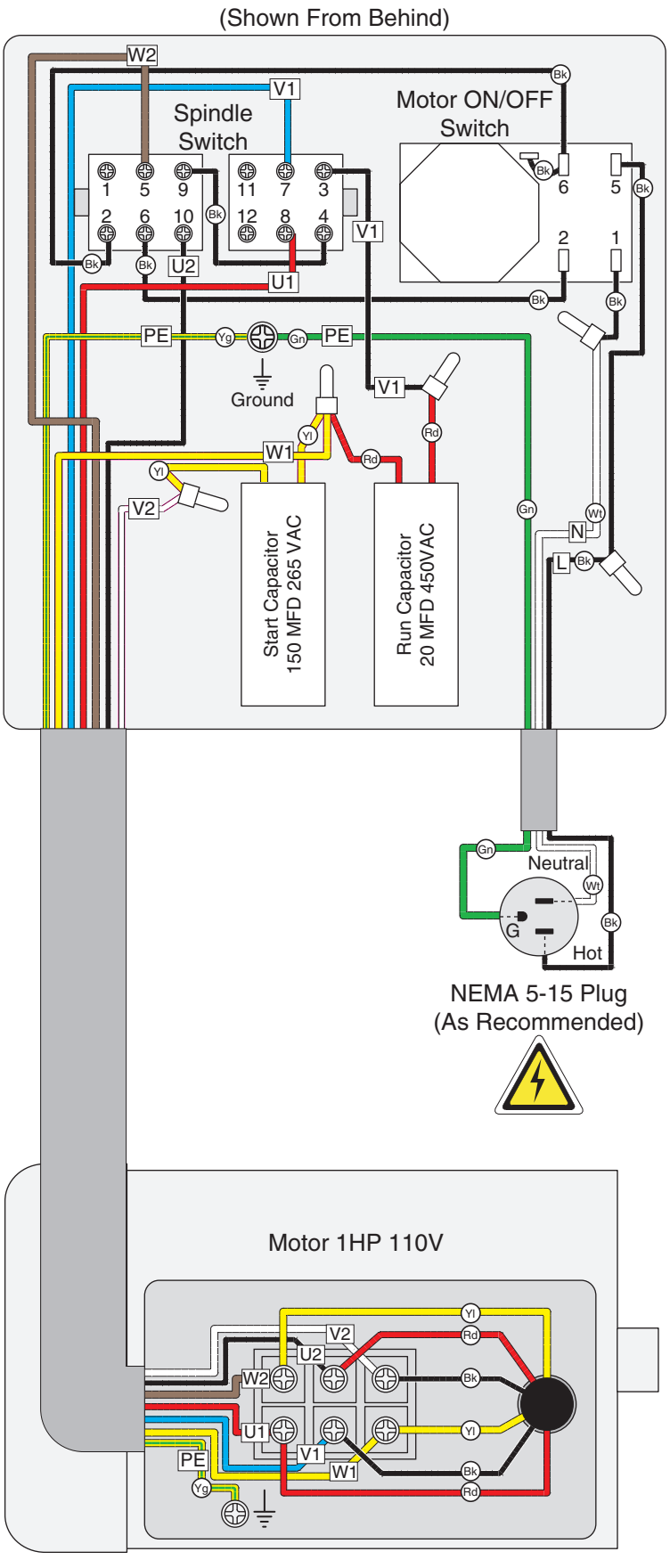
NOTICE

The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

BLACK	Bk	BLUE	Bl	YELLOW	Yl	LIGHT BLUE	Lb
WHITE	Wt	BROWN	Br	YELLOW GREEN	Yg	BLUE WHITE	Bw
GREEN	Gn	GRAY	Gy	PURPLE	Pu	TUR-QUOISE	Tu
RED	Rd	ORANGE	Or	PINK	Pk		

Wiring Diagram



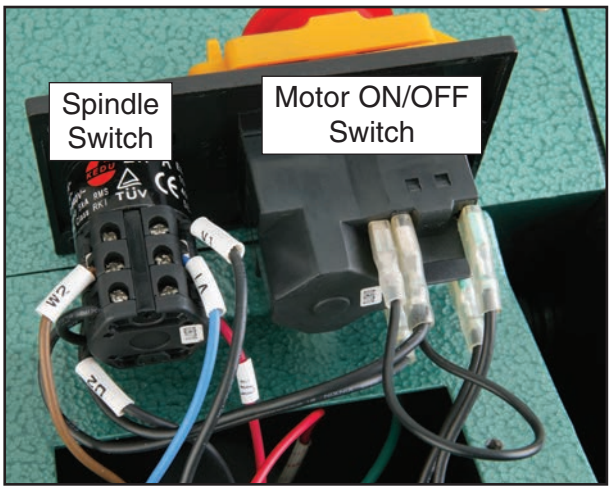


Figure 83. Switch wiring.

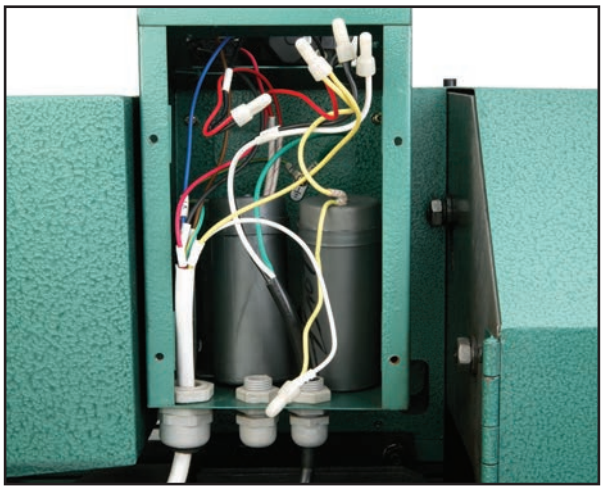


Figure 84. Electrical box wiring.

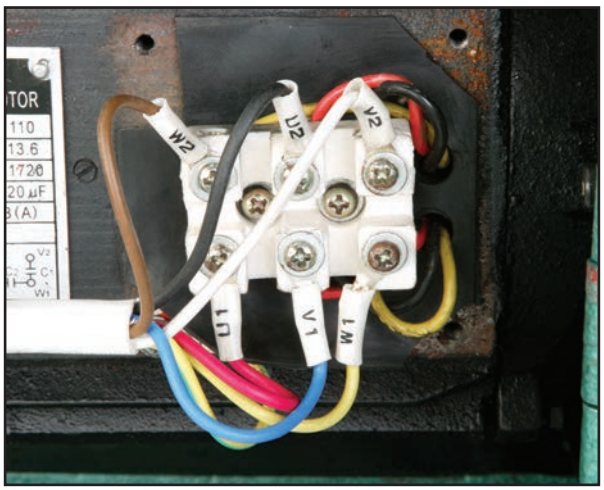
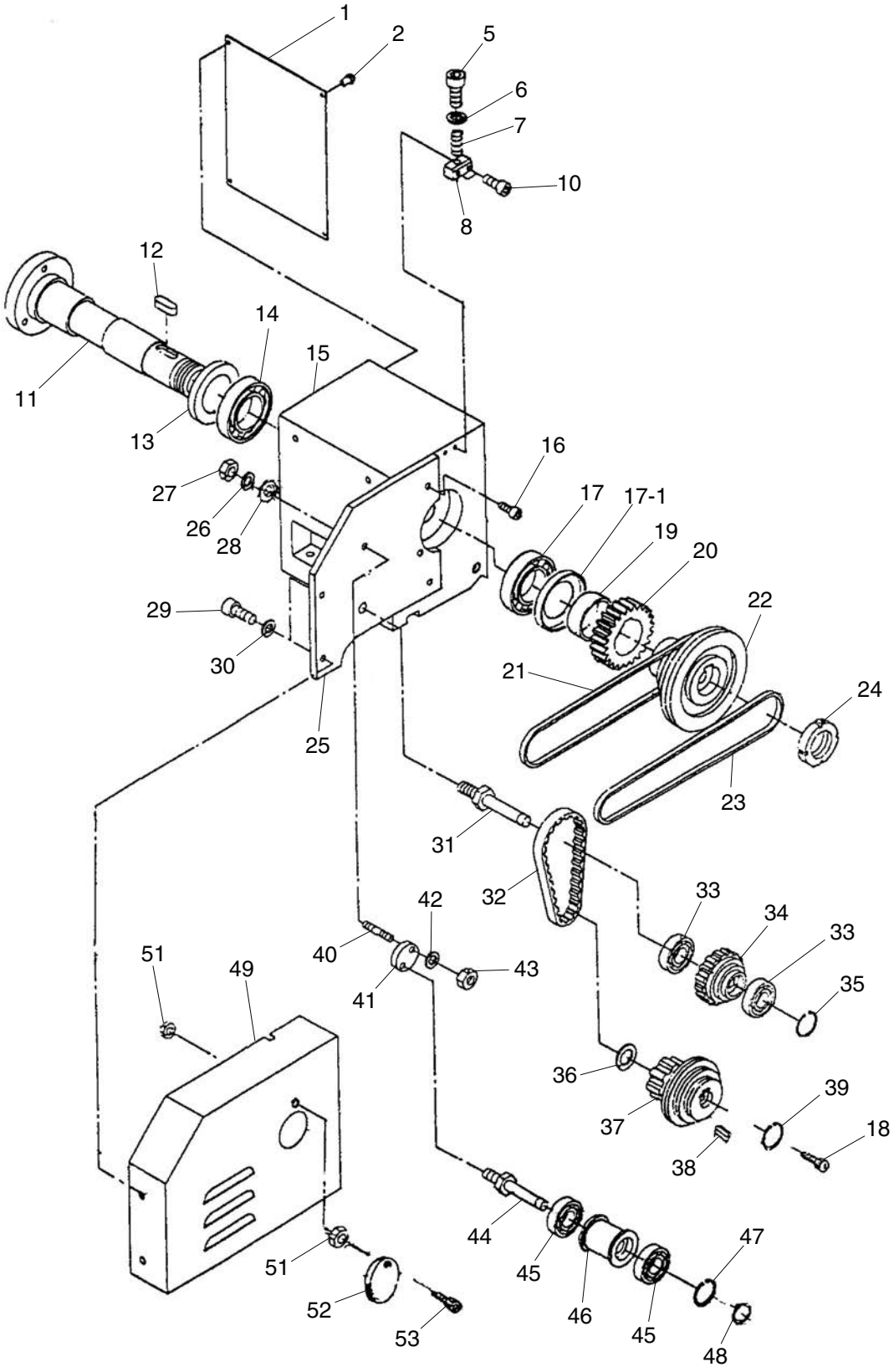


Figure 85. Motor wiring.

SECTION 9: PARTS

Headstock Breakdown

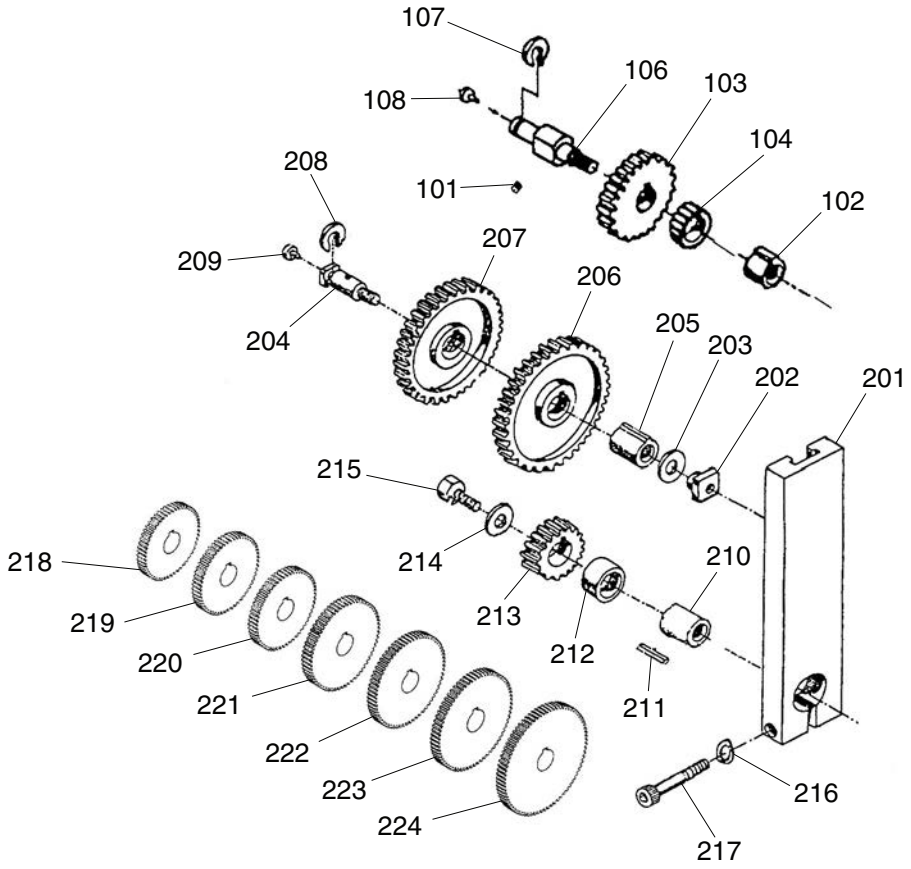


Headstock Parts List

REF	PART #	DESCRIPTION
1	P9972Z0001	HEADSTOCK NAMEPLATE
2	P9972Z0002	PHLP HD SCR M4-.7 X 6
5	P9972Z0005	CAP SCREW M6-1 X 25
6	P9972Z0006	FLAT WASHER 6MM
7	P9972Z0007	COMPRESSION SPRING .8 X 8 X 20
8	P9972Z0008	THREADED BLOCK
10	P9972Z0010	CAP SCREW M6-1 X 25
11	P9972Z0011	SPINDLE
12	P9972Z0012	KEY 10 X 10 X 55
13	P9972Z0013	SPACER
14	P9972Z0014	TAPER ROLLER BEARING 32009
15	P9972Z0015	HEADSTOCK CASTING
16	P9972Z0016	CAP SCREW M8-1.25 X 20
17	P9972Z0017	TAPER ROLLER BEARING 32009
17-1	P9972Z0017-1	BEARING CAP
18	P9972Z0018	PHLP HD SCR M6-1 X 20
19	P9972Z0019	SPACER
20	P9972Z0020	GEAR 45T
21	P9972Z0021	V-BELT M-29 3L290
22	P9972Z0022	SPINDLE PULLEY
23	P9972Z0023	V-BELT M-32 3L320
24	P9972Z0024	SPANNER NUT M30-3.5
25	P9972Z0025	BRACKET PLATE
26	P9972Z0026	LOCK WASHER 10MM
27	P9972Z0027	HEX NUT M10-1.5

REF	PART #	DESCRIPTION
28	P9972Z0028	FLAT WASHER 10MM
29	P9972Z0029	CAP SCREW M5-.8 X 10
30	P9972Z0030	FLAT WASHER 30MM
31	P9972Z0031	IDLER SHAFT
32	P9972Z0032	TIMING BELT
33	P9972Z0033	BALL BEARING 6001 2RS
34	P9972Z0034	IDLER PULLEY
35	P9972Z0035	INT RETAINING RING 12MM
36	P9972Z0036	PULLEY FLAT WASHER
37	P9972Z0037	MOTOR PULLEY
38	P9972Z0038	KEY 6 X 6 X 40
39	P9972Z0039	INT RETAINING RING 10MM
40	P9972Z0040	THREADED HANDLE ROD
41	P9972Z0041	PIVOT BRACKET
42	P9972Z0042	FLAT WASHER 10MM
43	P9972Z0043	HEX NUT M10-1.5
44	P9972Z0044	TENSIONING SHAFT
45	P9972Z0045	BALL BEARING 6001 2RS
46	P9972Z0046	IDLER ROLLER
47	P9972Z0047	INT RETAINING RING 28MM
48	P9972Z0048	EXT RETAINING RING 12MM
49	P9972Z0049	CHANGE GEAR COVER
51	P9972Z0051	HEX NUT M5-.8
52	P9972Z0052	OUTBOUND SPINDLE COVER
53	P9972Z0053	PHLP HD SCR M5-.8 X 12

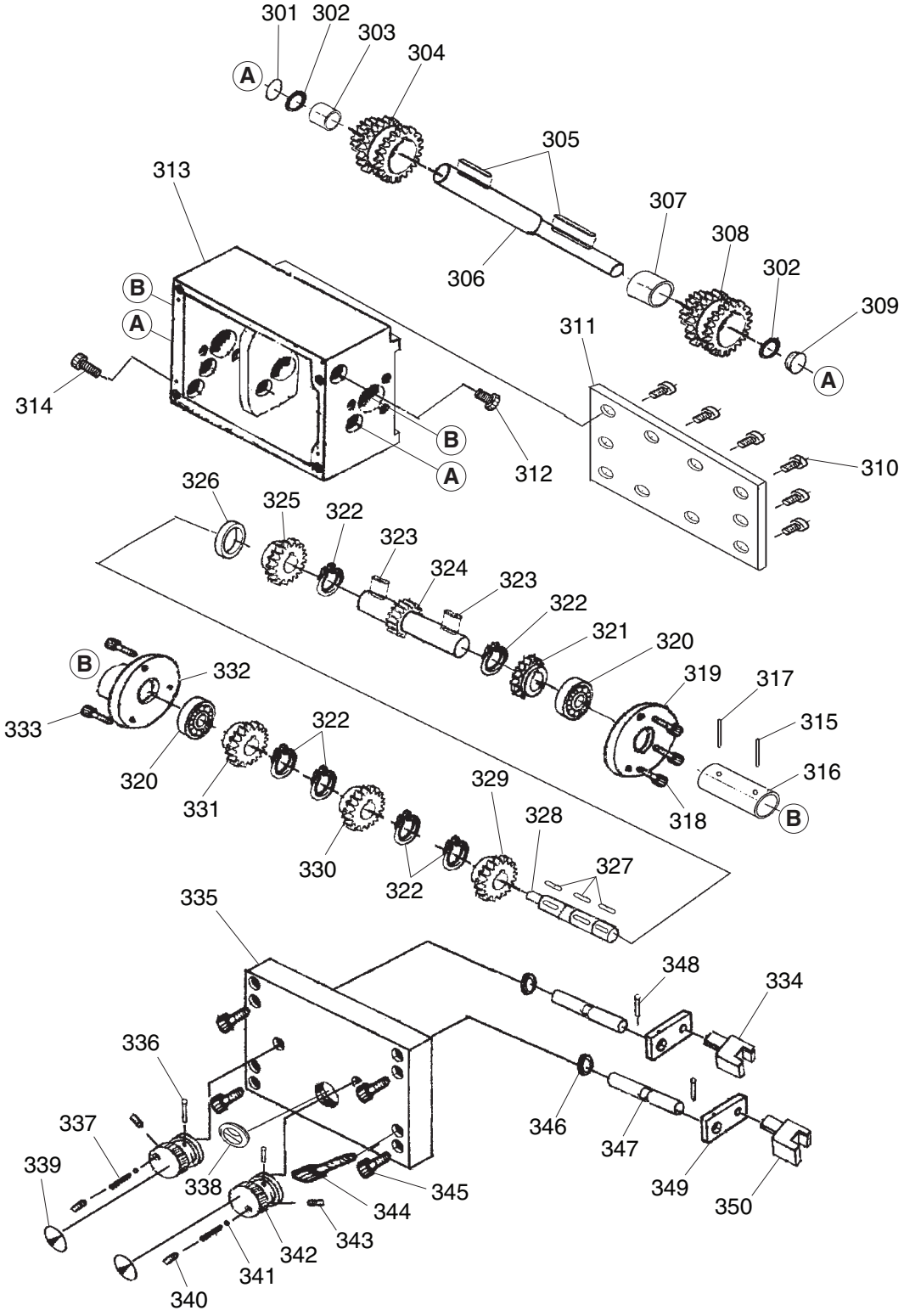
Change Gears Breakdown



REF	PART #	DESCRIPTION
101	P9972Z0101	SET SCREW M6-1 X 10
102	P9972Z0102	BUSHING
103	P9972Z0103	GEAR 45T
104	P9972Z0104	GEAR 24T
106	P9972Z0106	SHAFT
107	P9972Z0107	E-CLIP 9MM
108	P9972Z0108	BALL OILER 6MM
201	P9972Z0201	CHANGE GEAR BRACKET
202	P9972Z0202	PULLEY SHAFT SQUARE NUT
203	P9972Z0203	FLAT WASHER 6MM
204	P9972Z0204	SHAFT
205	P9972Z0205	KEYED BUSHING
206	P9972Z0206	GEAR 127T
207	P9972Z0207	GEAR 120T
208	P9972Z0208	E-CLIP 9MM
209	P9972Z0209	BALL OILER 6MM

REF	PART #	DESCRIPTION
210	P9972Z0210	BUSHING
211	P9972Z0211	KEY 4 X 4 X 14
212	P9972Z0212	SPACER
213	P9972Z0213	GEAR 84T
214	P9972Z0214	FLAT WASHER 6MM
215	P9972Z0215	CAP SCREW M6-1 X 10
216	P9972Z0216	LOCK WASHER 8MM
217	P9972Z0217	CAP SCREW M8-1.25 X 40
218	P9972Z0218	GEAR 28T
219	P9972Z0219	GEAR 35T
220	P9972Z0220	GEAR 63T
221	P9972Z0221	GEAR 69T
222	P9972Z0222	GEAR 70T
223	P9972Z0223	GEAR 77T
224	P9972Z0224	GEAR 78T

Feed Rate Gearbox Breakdown

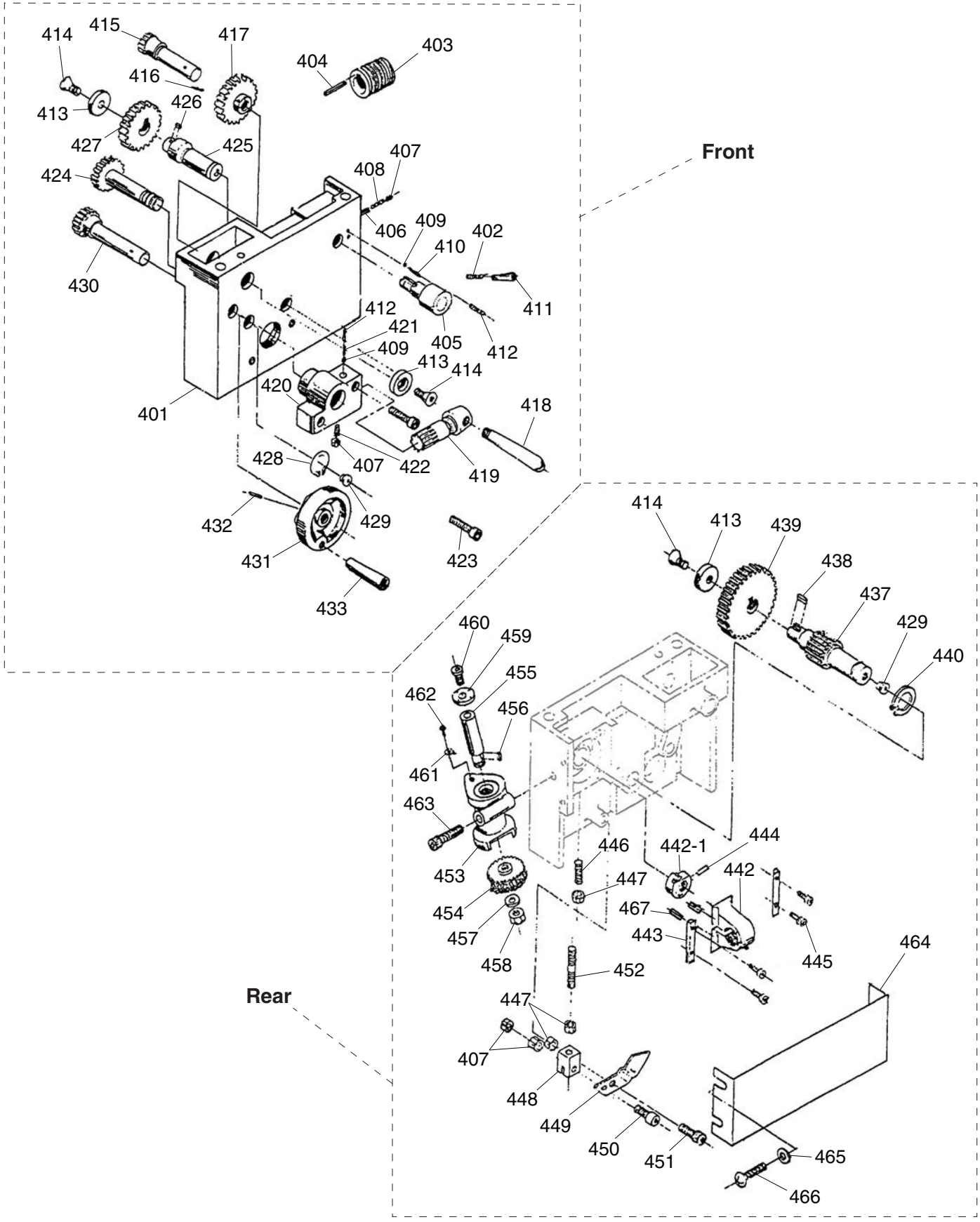


Feed Rate Gearbox Parts List

REF	PART #	DESCRIPTION
301	P9972Z0301	PLUG
302	P9972Z0302	O-RING 17 X 1.8
303	P9972Z0303	BUSHING
304	P9972Z0304	COMBO GEAR 30T/36T/33T
305	P9972Z0305	KEY 3 X 3 X 18
306	P9972Z0306	SHAFT
307	P9972Z0307	BUSHING
308	P9972Z0308	COMBO GEAR 22T/44T/33T
309	P9972Z0309	PLUG
310	P9972Z0310	CAP SCREW M5-.8 X 10
311	P9972Z0311	BACK GEARBOX COVER
312	P9972Z0312	FILL PLUG
313	P9972Z0313	GEARBOX CASTING
314	P9972Z0314	DRAIN PLUG
315	P9972Z0315	BRASS SHEAR PIN
316	P9972Z0316	LEADSCREW COLLAR
317	P9972Z0317	BRASS SHEAR PIN
318	P9972Z0318	CAP SCREW M6-1 X 12
319	P9972Z0319	FLANGE
320	P9972Z0320	BEARING
321	P9972Z0321	GEAR 33T
322	P9972Z0322	EXT RETAINING RING 12MM
323	P9972Z0323	KEY 4 X 4 X 8
324	P9972Z0324	GEAR SHAFT 22T
325	P9972Z0325	GEAR 44T

REF	PART #	DESCRIPTION
326	P9972Z0326	COLLAR
327	P9972Z0327	KEY 4 X 4 X 10
328	P9972Z0328	SHAFT
329	P9972Z0329	GEAR 33T
330	P9972Z0330	GEAR 30T
331	P9972Z0331	GEAR 35T
332	P9972Z0332	FLANGE
333	P9972Z0333	CAP SCREW M6-1 X 16
334	P9972Z0334	SHIFTING FORK
335	P9972Z0335	FRONT GEARBOX COVER
336	P9972Z0336	ROLL PIN 5 X 30
337	P9972Z0337	COMPRESSION SPRING .8 X 4.5 X 18
338	P9972Z0338	OIL SIGHT GLASS
339	P9972Z0339	INDICATOR DISC
340	P9972Z0340	SET SCREW M6-1 X 10
341	P9972Z0341	STEEL BALL 5MM
342	P9972Z0342	SHIFT HUB
343	P9972Z0343	SET SCREW M6-1 X 10
344	P9972Z0344	CAP SCREW M6-1 X 50
345	P9972Z0345	CAP SCREW M6-1 X 20
346	P9972Z0346	O-RING 6 X 1.8
347	P9972Z0347	SHAFT
348	P9972Z0348	ROLL PIN 5 X 20
349	P9972Z0349	SHIFT LEVER
350	P9972Z0350	SHIFTING FORK

Apron Breakdown

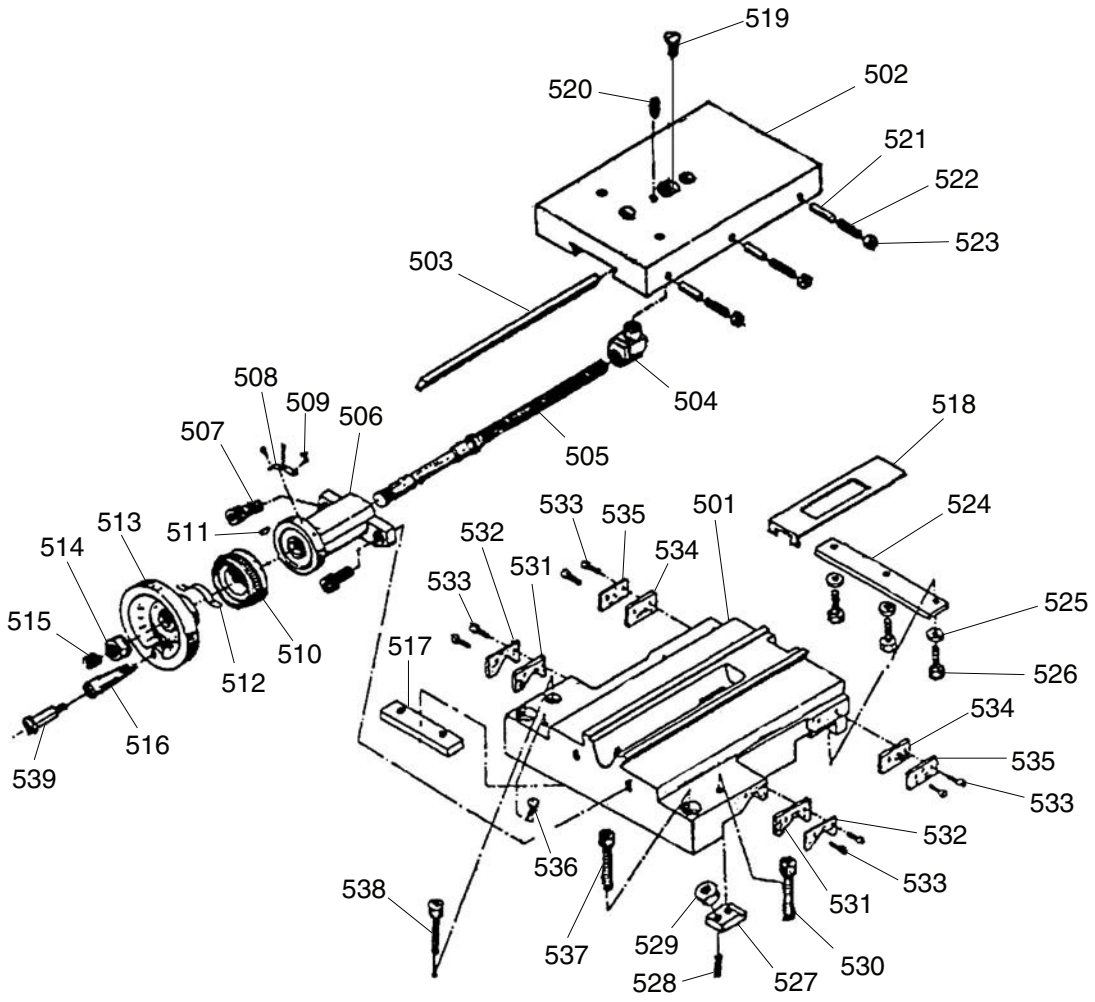


Apron Parts List

REF	PART #	DESCRIPTION
401	P9972Z0401	APRON CASTING
402	P9972Z0402	HANDLE SCREW
403	P9972Z0403	WORM GEAR
404	P9972Z0404	WORM GEAR KEY
405	P9972Z0405	HANDLE HUB
406	P9972Z0406	PIN 4 X 20
407	P9972Z0407	HEX NUT M5-.8
408	P9972Z0408	SET SCREW M5-.8 X 16
409	P9972Z0409	STEEL BALL 5MM
410	P9972Z0410	COMPRESSION SPRING
411	P9972Z0411	HANDLE
412	P9972Z0412	SET SCREW M6-1 X 6
413	P9972Z0413	FLAT WASHER 10MM
414	P9972Z0414	FLAT HD SCR M6-1 X 10
415	P9972Z0415	GEAR SHAFT 12T
416	P9972Z0416	ROLL PIN 4 X 30
417	P9972Z0417	GEAR 43T
418	P9972Z0418	HANDLE
419	P9972Z0419	GEAR SHAFT 13T
420	P9972Z0420	POWER FEED LEVER BRACKET
421	P9972Z0421	COMPRESSION SPRING
422	P9972Z0422	SET SCREW M4-.7 X 10
423	P9972Z0423	CAP SCREW M6-1 X 30
424	P9972Z0424	GEAR SHAFT 36T
425	P9972Z0425	SHAFT
426	P9972Z0426	KEY 4 X 4 X 6
427	P9972Z0427	GEAR 60T
428	P9972Z0428	EXT RETAINING RING 14MM
429	P9972Z0429	BALL OILER
430	P9972Z0430	GEAR SHAFT 22T
431	P9972Z0431	HANDWHEEL
432	P9972Z0432	ROLL PIN 4 X 24

REF	PART #	DESCRIPTION
433	P9972Z0433	HANDLE M8-1.25 X 83
437	P9972Z0437	GEAR SHAFT 18T
438	P9972Z0438	KEY 4 X 4 X 12
439	P9972Z0439	GEAR 42T
440	P9972Z0440	EXT RETAINING RING 12MM
442	P9972Z0442	HALF NUT INCH
442-1	P9972Z0442-1	HALF NUT BRACKET
443	P9972Z0443	HALF NUT GIB
444	P9972Z0444	ROLL PIN 2 X 35
445	P9972Z0445	CAP SCREW M4-.7 X 16
446	P9972Z0446	SET SCREW M5-.8 X 25
447	P9972Z0447	HEX NUT M5-.8
448	P9972Z0448	CONTROL BLOCK
449	P9972Z0449	PIVOT BRACKET
450	P9972Z0450	CAP SCREW M4-.7 X 20
451	P9972Z0451	CAP SCREW M5-.8 X 16
452	P9972Z0452	STUD-DE M5-.8 X 36 15 15
453	P9972Z0453	THREAD DIAL BODY
454	P9972Z0454	PINION GEAR 64T
455	P9972Z0455	SHAFT
456	P9972Z0456	KEY 3 X 3 X 10
457	P9972Z0457	LOCK WASHER 8MM
458	P9972Z0458	HEX NUT M8-1.25
459	P9972Z0459	THREAD DIAL
460	P9972Z0460	PHLP HD SCR M6-1 X 10
461	P9972Z0461	POINTER
462	P9972Z0462	STEEL FLUTED RIVET 2 X 5MM
463	P9972Z0463	CAP SCREW M4-.7 X 6
464	P9972Z0464	REAR APRON COVER
465	P9972Z0465	FLAT WASHER 4MM
466	P9972Z0466	PHLP HD SCR M4-.7 X 6
467	P9972Z0467	ROLL PIN 5 X 12

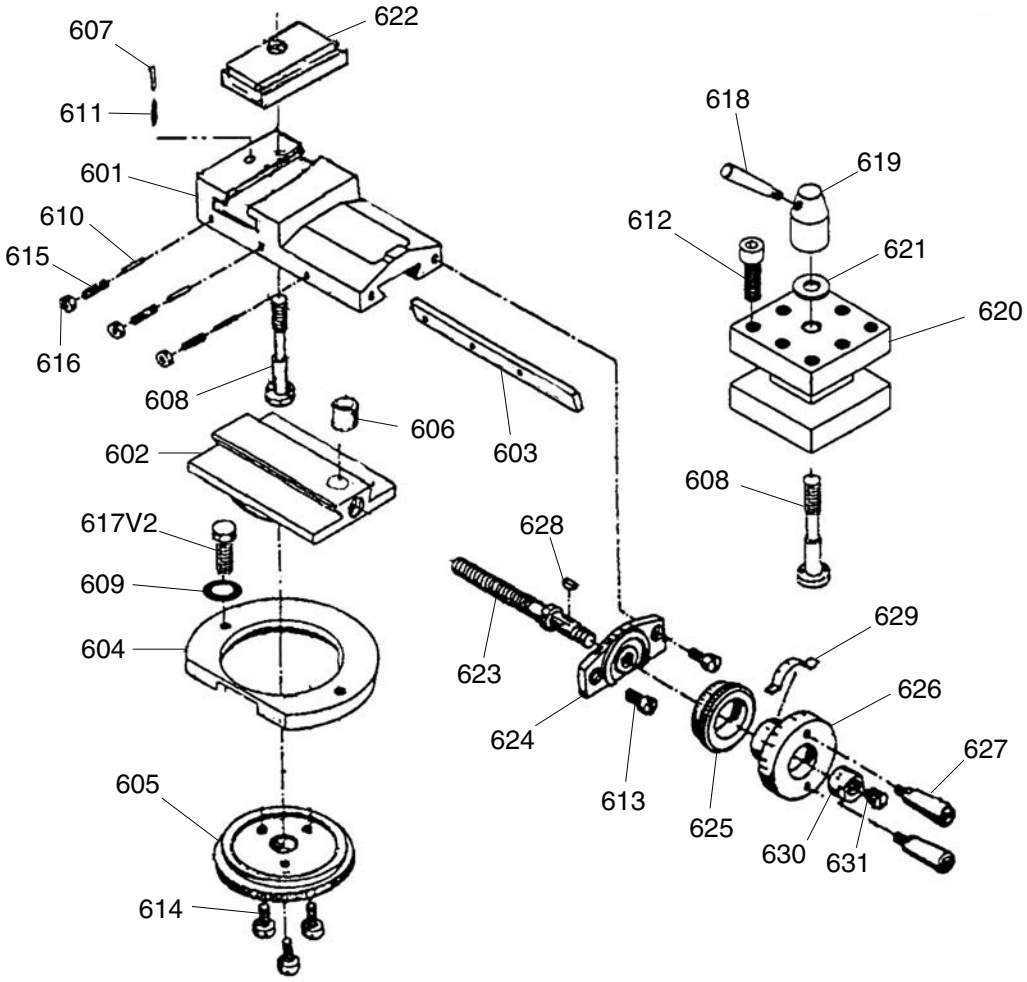
Saddle & Cross Slide Breakdown



REF	PART #	DESCRIPTION
501	P9972Z0501	SADDLE
502	P9972Z0502	CROSS SLIDE
503	P9972Z0503	CROSS SLIDE GIB
504	P9972Z0504	CROSS SLIDE LEADSCREW NUT
505	P9972Z0505	CROSS SLIDE LEADSCREW
506	P9972Z0506	CROSS SLIDE LEADSCREW BRACKET
507	P9972Z0507	CAP SCREW M8-1.25 X 25
508	P9972Z0508	INDICATOR PLATE
509	P9972Z0509	STEEL FLUTED RIVET 2 X 5MM
510	P9972Z0510	CROSS SLIDE GRADUATED DIAL
511	P9972Z0511	KEY 3 X 3 X 6
512	P9972Z0512	SPRING PLATE
513	P9972Z0513	HANDWHEEL
514	P9972Z0514	HANDWHEEL RETAINING NUT
515	P9972Z0515	SET SCREW M8-1.25 X 6
516	P9972Z0516	HANDLE
517	P9972Z0517	SLIDE BLOCK
518	P9972Z0518	CHIP GUARD
519	P9972Z0519	CAP SCREW M6-1 X 12
520	P9972Z0520	SET SCREW M6-1 X 16

REF	PART #	DESCRIPTION
521	P9972Z0521	CROSS SLIDE LOCK PIN
522	P9972Z0522	SET SCREW M5-.8 X 16
523	P9972Z0523	HEX NUT M5-.8
524	P9972Z0524	SADDLE GIB
525	P9972Z0525	FLAT WASHER 6MM
526	P9972Z0526	CAP SCREW M6-1 X 16
527	P9972Z0527	CLIP
528	P9972Z0528	SET SCREW M6-1 X 20
529	P9972Z0529	HEX NUT M6-1
530	P9972Z0530	CAP SCREW M6-1 X 35
531	P9972Z0531	NOTCHED WAY WIPER
532	P9972Z0532	NOTCHED WIPER CLAMP
533	P9972Z0533	PHLP HD SCR M4-.7 X 8
534	P9972Z0534	STRAIGHT WAY WIPER
535	P9972Z0535	STRAIGHT WIPER CLAMP
536	P9972Z0536	BALL OILER
537	P9972Z0537	CAP SCREW M8-1.25 X 35
538	P9972Z0538	CAP SCREW M6-1 X 35
539	P9972Z0539	HANDLE BOLT

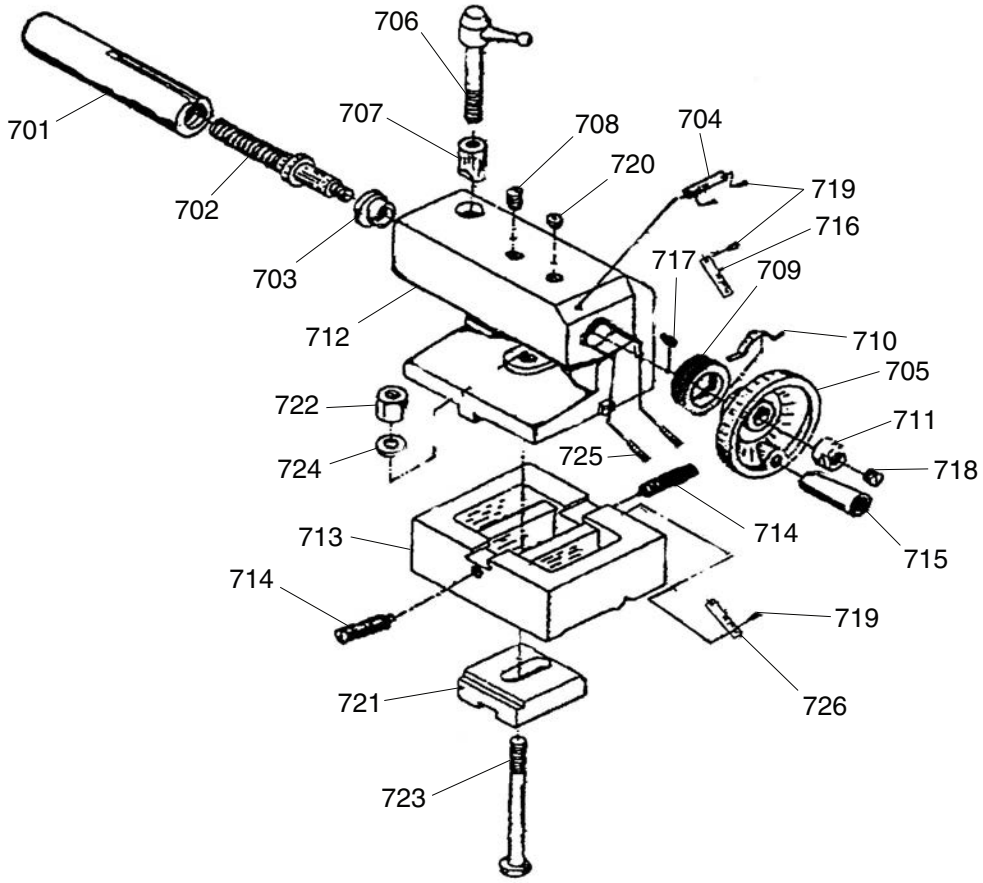
Compound Slide & Tool Post Breakdown



REF	PART #	DESCRIPTION
601	P9972Z0601	COMPOUND SLIDE
602	P9972Z0602	SWIVEL BASE
603	P9972Z0603	COMPOUND SLIDE GIB
604	P9972Z0604	CLAMPING RING
605	P9972Z0605	CLAMPING BASE
606	P9972Z0606	LEADSCREW NUT
607	P9972Z0607	PLUNGER
608	P9972Z0608	TOOL POST STUD
609	P9972Z0609	FLAT WASHER 10MM
610	P9972Z0610	SLIDE LOCK PIN
611	P9972Z0611	COMPRESSION SPRING
612	P9972Z0612	TOOL POST CAP SCREW
613	P9972Z0613	CAP SCREW M8-1.25 X 25
614	P9972Z0614	CAP SCREW M6-1 X 12
615	P9972Z0615	SET SCREW M5-.8 X 16
616	P9972Z0616	HEX NUT M5-.8

REF	PART #	DESCRIPTION
617V2	P9972Z0617V2	CAP SCREW M5-.8 X 30
618	P9972Z0618	TOOL POST HANDLE
619	P9972Z0619	TOOL POST HANDLE HUB
620	P9972Z0620	TOOL POST BODY
621	P9972Z0621	HUB FLAT WASHER
622	P9972Z0622	TOOL REST BASE
623	P9972Z0623	COMPOUND SLIDE LEADSCREW
624	P9972Z0624	LEADSCREW BRACKET
625	P9972Z0625	GRADUATED DIAL
626	P9972Z0626	HANDWHEEL
627	P9972Z0627	HANDLE
628	P9972Z0628	KEY 3 X 3 X 8
629	P9972Z0629	SPRING PLATE
630	P9972Z0630	THREADED COLLAR
631	P9972Z0631	SET SCREW M8-1.25 X 16

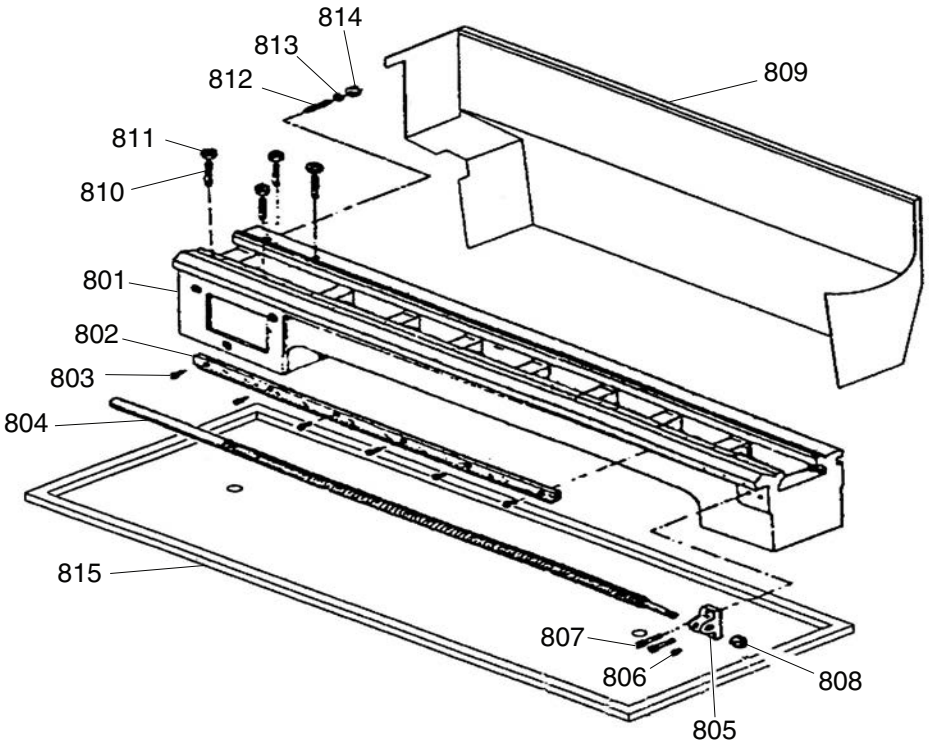
Tailstock Breakdown



REF	PART #	DESCRIPTION
701	P9972Z0701	TAILSTOCK QUILL MT#3
702	P9972Z0702	TAILSTOCK LEADSCREW
703	P9972Z0703	BUSHING
704	P9972Z0704	INDICATOR PLATE
705	P9972Z0705	HANDWHEEL
706	P9972Z0706	QUILL LOCK
707	P9972Z0707	LOCK BUSHING
708	P9972Z0708	SET SCREW M6-1 X 12
709	P9972Z0709	GRADUATED DIAL
710	P9972Z0710	SPRING PLATE
711	P9972Z0711	SPACER
712	P9972Z0712	TAILSTOCK CASTING
713	P9972Z0713	TAILSTOCK BASE

REF	PART #	DESCRIPTION
714	P9972Z0714	SET SCREW M8-1.25 X 25
715	P9972Z0715	HANDLE
716	P9972Z0716	PLATE
717	P9972Z0717	KEY 3 X 3 X 10
718	P9972Z0718	HEX NUT M10-1.5
719	P9972Z0719	STEEL FLUTED RIVET 2 X 5MM
720	P9972Z0720	OIL PORT 9MM
721	P9972Z0721	CLAMPING PLATE
722	P9972Z0722	CLAMPING PLATE HEX NUT
723	P9972Z0723	HEX BOLT M12-1.75 X 100
724	P9972Z0724	FLAT WASHER 12MM
725	P9972Z0725	SET SCREW M5-.8 X 6
726	P9972Z0726	INDICATOR PLATE

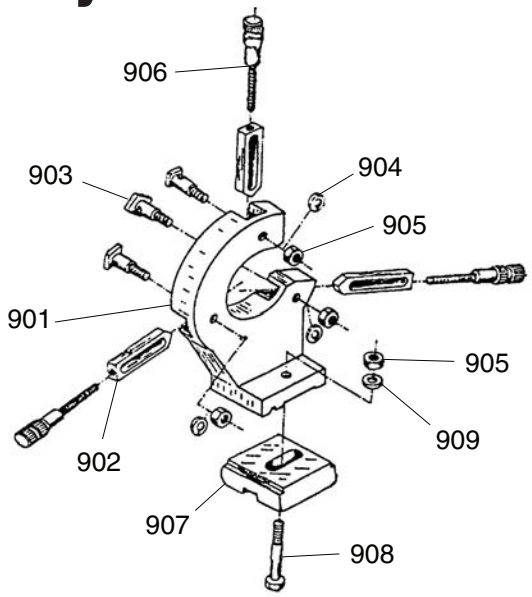
Bed Breakdown



REF	PART #	DESCRIPTION
801	P9972Z0801	BED
802	P9972Z0802	RACK
803	P9972Z0803	CAP SCREW M5-.8 X 12
804	P9972Z0804	FEED LEADSCREW INCH
805	P9972Z0805	LEADSCREW END BRACKET
806	P9972Z0806	BALL OILER
807	P9972Z0807	CAP SCREW M6-1 X 20
808	P9972Z0808	HEX NUT M10-1.5

REF	PART #	DESCRIPTION
809	P9972Z0809	SPLASH GUARD
810	P9972Z0810	STUD-SE M10-1.5 X 45 35
811	P9972Z0811	HEX NUT M10-1.5
812	P9972Z0812	SET SCREW M8-1.25 X 40
813	P9972Z0813	FLAT WASHER 8MM
814	P9972Z0814	HEX NUT M8-1.25
815	P9972Z0815	CHIP PAN

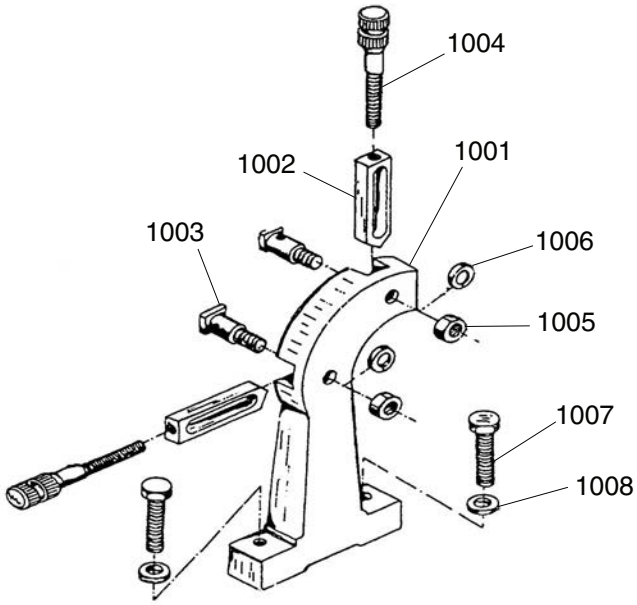
Steady Rest Breakdown



REF	PART #	DESCRIPTION
901	P9972Z0901	STEADY REST CASTING
902	P9972Z0902	FINGER
903	P9972Z0903	FINGER T-BOLT
904	P9972Z0904	LOCK WASHER 8MM
905	P9972Z0905	HEX NUT M6-1

REF	PART #	DESCRIPTION
906	P9972Z0906	ADJUSTING SCREW
907	P9972Z0907	CLAMPING PLATE
908	P9972Z0908	HEX BOLT M12-1.75 X 65
909	P9972Z0909	FLAT WASHER 12MM

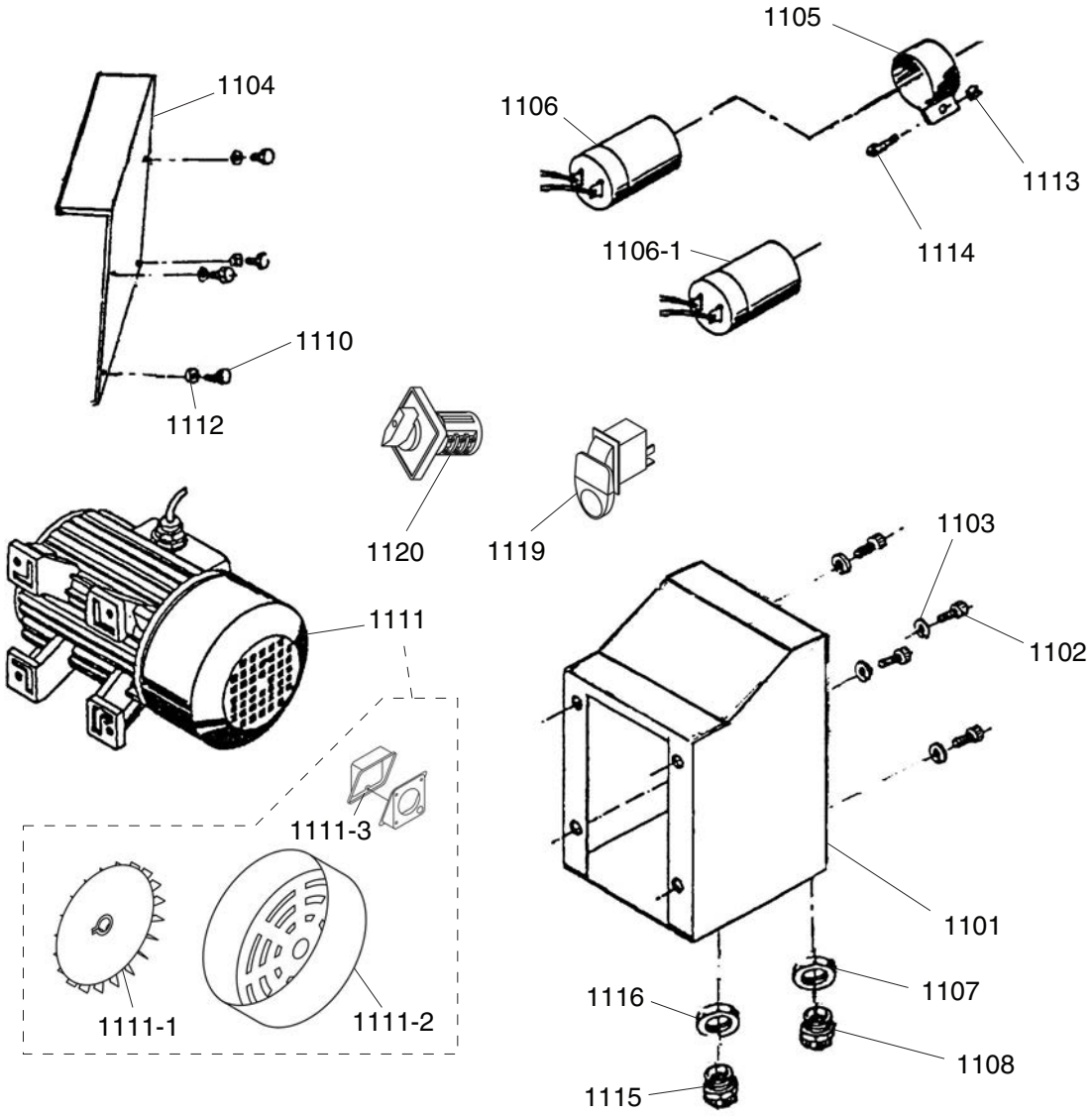
Follow Rest Breakdown



REF	PART #	DESCRIPTION
1001	P9972Z1001	FOLLOW REST CASTING
1002	P9972Z1002	FINGER
1003	P9972Z1003	FINGER T-BOLT
1004	P9972Z1004	ADJUSTING SCREW

REF	PART #	DESCRIPTION
1005	P9972Z1005	HEX NUT M6-1
1006	P9972Z1006	FLAT WASHER 8MM
1007	P9972Z1007	CAP SCREW M8-1.25 X 35
1008	P9972Z1008	FLAT WASHER 6MM

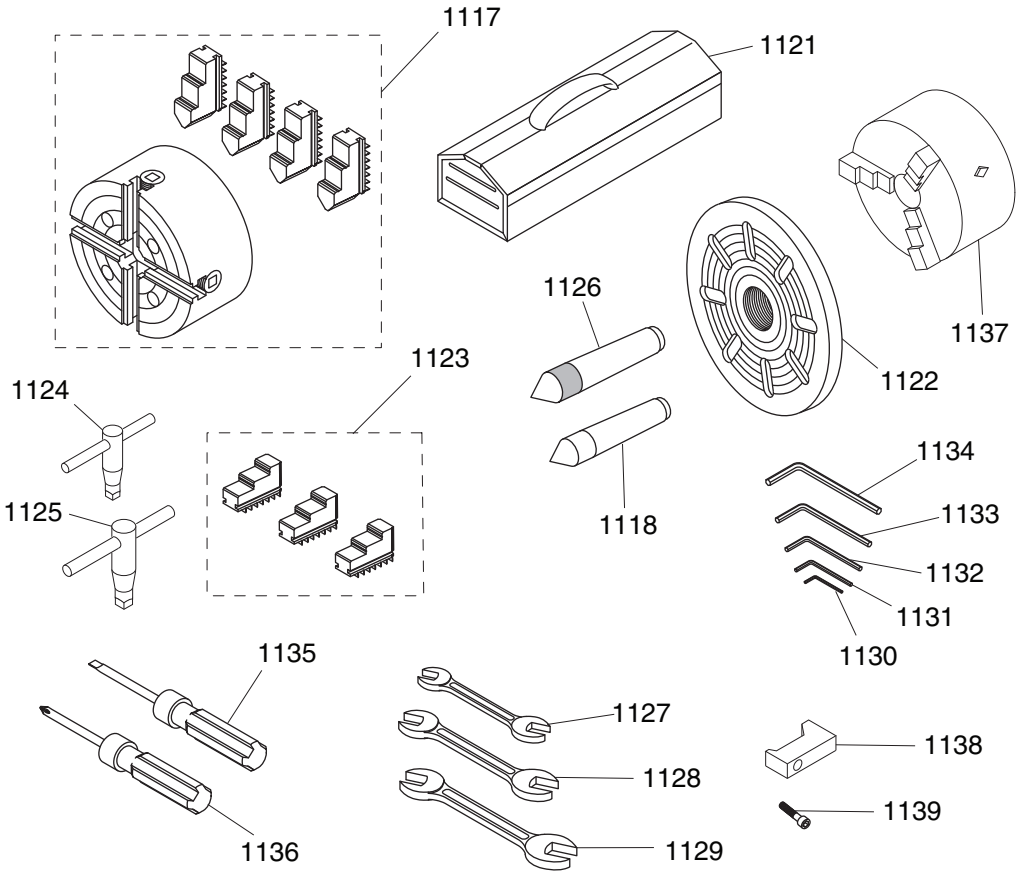
Electrical Components Breakdown



REF	PART #	DESCRIPTION
1101	P9972Z1101	ELECTRICAL CABINET
1102	P9972Z1102	CAP SCREW M6-1 X 25
1103	P9972Z1103	LOCK WASHER 6MM
1104	P9972Z1104	ELECTRICAL CABINET COVER
1105	P9972Z1105	CAPACITOR COVER W/CLIP
1106	P9972Z1106	S CAPACITOR 150M
1106-1	P9972Z1106-1	R CAPACITOR 20M
1107	P9972Z1107	STRAIN RELIEF NUT 1/2"
1108	P9972Z1108	STRAIN RELIEF 1/2"
1110	P9972Z1110	PHLP HD SCR M5-.8 X 10
1111	P9972Z1111	MOTOR 1HP 110V 1PH

REF	PART #	DESCRIPTION
1111-1	P9972Z1111-1	MOTOR FAN
1111-2	P9972Z1111-2	MOTOR FAN COVER
1111-3	P9972Z1111-3	MOTOR WIRING JUNCTION BOX
1112	P9972Z1112	LOCK WASHER 5MM
1113	P9972Z1113	HEX NUT M4-.7
1114	P9972Z1114	PHLP HD SCR M4-.7 X 20
1115	P9972Z1115	STRAIN RELIEF 3/4"
1116	P9972Z1116	STRAIN RELIEF NUT 3/4"
1119	P9972Z1119	ON/OFF SWITCH W/COVER
1120	P9972Z1120	ROTARY SWITCH 3-POSITION

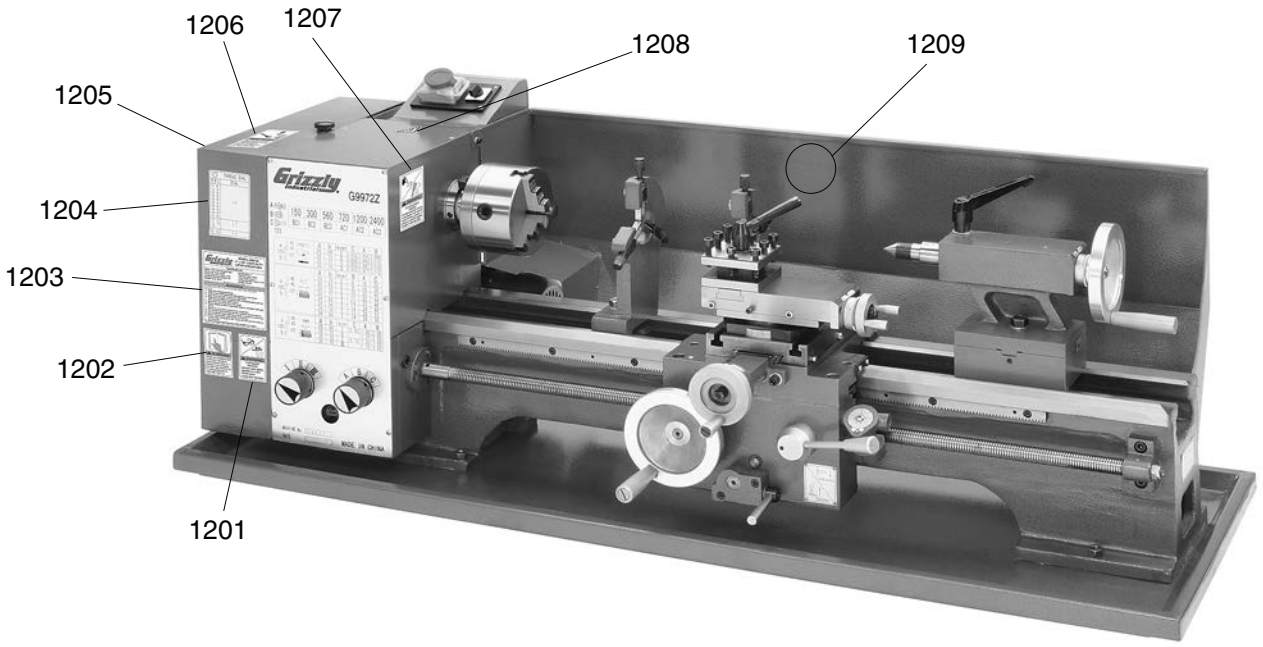
Accessories Breakdown



REF	PART #	DESCRIPTION
1117	P9972Z1117	4-JAW CHUCK 6-1/4"
1118	P9972Z1118	DEAD CENTER MT#3
1121	P9972Z1121	TOOL BOX
1122	P9972Z1122	FACEPLATE 8"
1123	P9972Z1123	3-JAW CHUCK REVERSE JAW SET
1124	P9972Z1124	3-JAW CHUCK KEY
1125	P9972Z1125	4-JAW CHUCK KEY
1126	P9972Z1126	CARBIDE-TIPPED DEAD CENTER MT#3
1127	P9972Z1127	WRENCH 8/10MM OPEN ENDS
1128	P9972Z1128	WRENCH 12/14MM OPEN ENDS
1129	P9972Z1129	WRENCH 17/19MM OPEN ENDS

REF	PART #	DESCRIPTION
1130	P9972Z1130	HEX WRENCH 3MM
1131	P9972Z1131	HEX WRENCH 4MM
1132	P9972Z1132	HEX WRENCH 5MM
1133	P9972Z1133	HEX WRENCH 6MM
1134	P9972Z1134	HEX WRENCH 8MM
1135	P9972Z1135	FLAT SCREWDRIVER #2
1136	P9972Z1136	PHILLIPS SCREWDRIVER #2
1137	P9972Z1137	3-JAW CHUCK
1138	P9972Z1138	SPINDLE CLAMP
1139	P9972Z1139	CAP SCREW M6-1 X 20

Label Placement



REF	PART #	DESCRIPTION
1201	P9972Z1201	EYE HAZARD LABEL VERT
1202	P9972Z1202	READ MANUAL LABEL VERT
1203	P9972Z1203	MACHINE ID LABEL
1204	P9972Z1204	THREAD DIAL CHART LABEL
1205	P9972Z1205	PINCH HAZARD LABEL HORIZ

REF	PART #	DESCRIPTION
1206	P9972Z1206	DISCONNECT POWER LABEL VERT
1207	P9972Z1207	ENTANGLEMENT HAZARD LABEL
1208	P9972Z1208	ELECTRICITY LABEL
1209	P9972Z1209	GRIZZLY GREEN TOUCH UP PAINT

⚠WARNING

Safety labels warn about machine hazards and ways to prevent injury. The owner of this machine MUST maintain the original location and readability of the labels on the machine. If any label is removed or becomes unreadable, REPLACE that label before using the machine again. Contact Grizzly at (800) 523-4777 or www.grizzly.com to order new labels.

Grizzly Industrial, Inc. WARRANTY CARD

Name _____

Street _____

City _____ State _____ Zip _____

Phone # _____ Email _____

Model # _____ Order # _____ Serial # _____

The following information is given on a voluntary basis. It will be used for marketing purposes to help us develop better products and services. ***Of course, all information is strictly confidential.***

1. How did you learn about us?

____ Advertisement ____ Friend ____ Catalog
____ Card Deck ____ Website ____ Other:

2. Which of the following magazines do you subscribe to?

____ Cabinetmaker & FDM
____ Family Handyman
____ Hand Loader
____ Handy
____ Home Shop Machinist
____ Journal of Light Cont.
____ Live Steam
____ Model Airplane News
____ Old House Journal
____ Popular Mechanics
____ Popular Science
____ Popular Woodworking
____ Precision Shooter
____ Projects in Metal
____ RC Modeler
____ Rifle
____ Shop Notes
____ Shotgun News
____ Today's Homeowner
____ Wood
____ Wooden Boat
____ Woodshop News
____ Woodsmith
____ Woodwork
____ Woodworker West
____ Woodworker's Journal
____ Other:

3. What is your annual household income?

____ $20,000-$29,000 ____ $30,000-$39,000 ____ $40,000-$49,000
____ $50,000-$59,000 ____ $60,000-$69,000 ____ $70,000+

4. What is your age group?

____ 20-29 ____ 30-39 ____ 40-49
____ 50-59 ____ 60-69 ____ 70+

5. How long have you been a woodworker/metalworker?

____ 0-2 Years ____ 2-8 Years ____ 8-20 Years ____ 20+ Years

6. How many of your machines or tools are Grizzly?

____ 0-2 ____ 3-5 ____ 6-9 ____ 10+

7. Do you think your machine represents a good value? _____Yes _____No

8. Would you recommend Grizzly Industrial to a friend? _____Yes _____No

9. Would you allow us to use your name as a reference for Grizzly customers in your area?
Note: *We never use names more than 3 times.* _____Yes _____No

10. Comments: _____

_____

_____

_____

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TAPE ALONG EDGES--PLEASE DO NOT STAPLE

WARRANTY AND RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

To take advantage of this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number,'' which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

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